The Iron Age

A Review of the Hardware and Metal Trades.

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Architectural Iron Construction.

Early History of the Business—The Present Building and Fire Laws—Testing of Iron Columns, etc.—Bad Workmanship.

I.

The advancement made by American builders in the adaptation of iron to purposes of architecture has been so great during the past decade, that about a year ago Sir Morton Peto sent agents to the works of J. B. & J. M. Cornell, of this city, to obtain copies of the plans and specifications of our prominent buildings for reference in the construction of English works. This fact stands out in strong contrast with an Act of Parliament, passed about thirty years ago, forbidding the erection of cast iron columns in London.

The credit of inventing the first practicable system of iron construction, and of carrying it into practice, belongs to

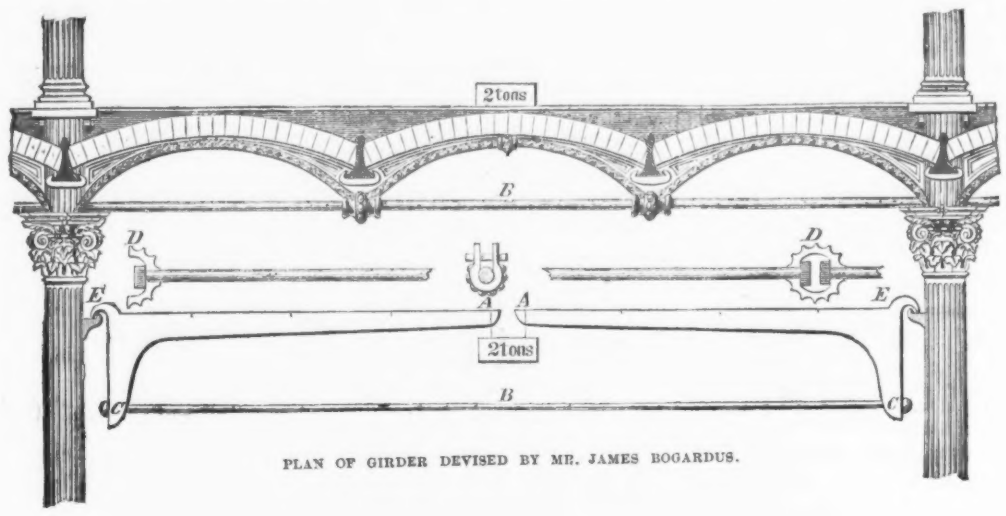
JAMES BOGARDUS,

of this city. Among the many features of iron architecture which Mr. Bogardus originated may be included, according to his own statement, the I beam or girder. When he commenced the business of constructing cast iron buildings, the use of iron for such purposes was very rare, the only instances of its employment in this manner being the substitution of water pipes or of rude solid columns for the ordinary stone posts which supported the first story of buildings. The idea of constructing a building entirely of cast iron, and of imitating, in this material, the usual ornamental forms of architecture, was first conceived by Mr. Bogardus while traveling in Italy, in 1840, and during his subsequent travels he developed his plans. The first complete cast iron structure erected in America was the manufactory of the inventor, on the corner of Center and Duane streets, New York. (See illustration.) A model of the building was placed on exhibition for examination by visitors in the summer of 1847, and in May, 1848, the foundation was laid. The first pattern used in its construction was made with great care, and when finished, was planed and highly polished at a very considerable cost.

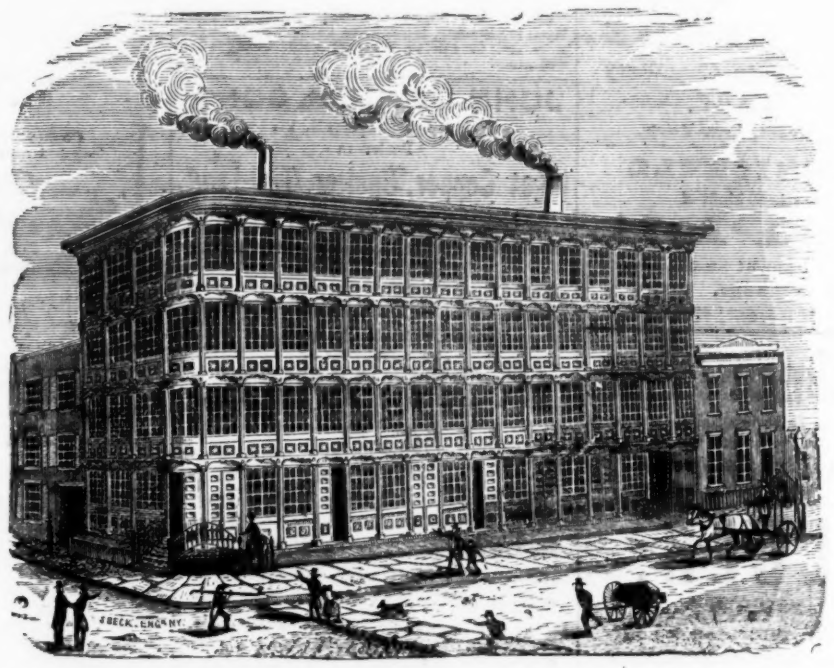
The following summary of the inventions of this remarkable man, extracted from Appleton's New Cyclopædia, is very interesting: "He was the inventor of an eight-day, three wheel chronometer; a ring flyer for spinning cotton, known as a 'ring spinner;' an eccentric mill, differing from other mills in having both grinding surfaces running in the same direction at nearly equal speed; and a transfer machine which is in general use for producing bank note plates from separate dies. He invented the first dry gas meter, and the first pencil case made without a slot. His plan for a penny post system was selected from 2600 competitors by an English commision. He invented a method, now in common use, of pressing glass; one for cutting India rubber into fine threads; a dynamometer for measuring the speed of machinery in motion; a pyrometer of remarkable delicacy; a deep sea sounding machine, and several drills and chucks."

Previous to the erection of his first building, the opinions of most scientific men were opposed to his own ideas, and there existed also a very decided prejudice against any use of cast iron for buildings. Several accidents, which had happened from the breaking of cast iron beams in England, had tended to increase the prejudice with which such buildings were naturally regarded. The opposition growing out of this state of public feeling was very great, and in addition to the difficulties with which the undertaking of any new work is usually attended, Mr. Bogardus was constantly annoyed by predictions of failure. One officious individual stated that he would not live in the building if he had it as a gift, lest it should crush itself by its own weight. Another held forth, in emphatic terms, on the dangers from lightning to which such a building was liable. Another had discovered that the walls were not perpendicular, and that sooner or later the structure would topple to the ground. Another asserted that in case of a fire the columns would melt, and the whole would fall with one tremendous crash. A large number had found a certain objection to the building in the expansion and contraction of the columns and beams by heat, and that in consequence of this property of metals the building would soon wriggle itself to pieces. For a time work was suspended on the structure, and the undertaking was regarded by others as abandoned, and the unfinished skeleton was called "Bogardus' Folly." In addition to the perpetual annoyance engendered by this gratuitous advice, the inventor had to personally superintend every detail of construction in the building, so little was there known concerning the matter. The pattern for his first iron column, which was fluted, was first made in wood, and highly planed and polished, and from this an iron pattern was cast. The art of founding had not then attained such excellence as to enable the founder to obtain a good casting from a wooden pattern, and the metal pattern was, therefore, necessary, to produce the casting. When the metal pattern was obtained it was planed down and polished so as to obtain the most perfect results. The expensiveness of his first pattern, to which we have before referred, may, therefore, be easily explained. To increase the difficulty of the undertaking, complaints were made to the city authorities against this building, and some of the tenants of the neighboring buildings actually left their houses for fear of danger. This occasioned much delay in the enterprise.

This building merits description from the fact that it was built on a plan directly the reverse of that now in use. Mr. Bogardus himself thus describes it: (See illustration.) "The cast iron frame of the building rested upon sills which were cast in sections. These sections, by the aid of the planing machine, were made of equal thickness, so as not to admit of any variation throughout the whole. They were laid upon a stone foundation, and were fastened together with bolts. On the joint of the sills were placed the columns, all exactly equal in hight, and having both their ends faced in a turning lathe, so as to make them perfecty plane and parallel, and each column was firmly bolted to the ends of the two adjacent sills on which it rested. These columns supported another series of sills, fascias, or cornices in sections, of the same length as the former, but of greater hight, according to the design of the architect; they were separately made of equal dimensions by the planing machine, and were bolted to the columns and to each other in the same manner as before. On these again stood another row of columns, and on these columns rested another series of fascias or cornices, and so on continually for any number of stories. From this description it may be seen that each end of every column acts as a strap to the adjacent joint of the cornice, and the several parts are so firmly united as to form one stable whole, equivalent in strength to a single piece of cast iron." In the plan of iron construction employed at the present day the columns rest one upon the other from top to bottom, and the horizontal tiers are sustained by lugs upon the columns. In Bogardus' plan the horizontal sills or cornices are continuous, and support the columns.



PLAN OF GIRDER DEVISED BY MR. JAMES BOGARDUS.



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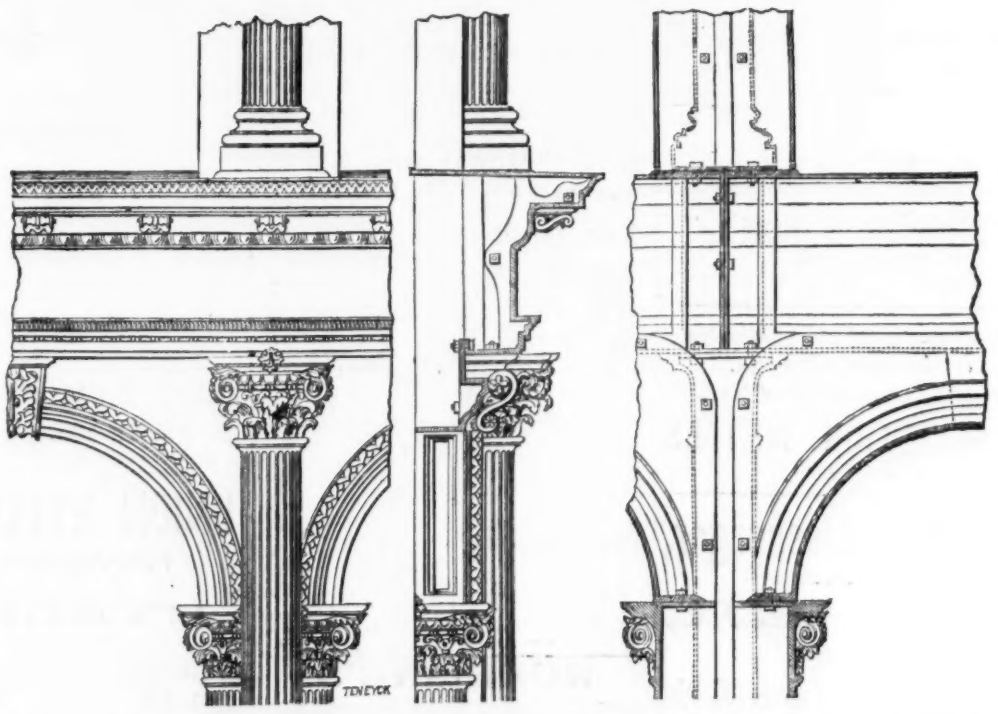

FRONT AND REAR ELEVATIONS AND SECTION OF A PORTION OF AN IRON BUILDING CONSTRUCTED UNDER MR. BOGARDUS' PATENT.

Mr. Bogardus must have the credit, also, of introducing the use of heavy castings such as are now employed. He also largely increased the use of planers. He introduced the present method of forming capitals, and having neglected to patent the invention, it has long since become common property. The girder which we have illustrated was invented by Mr. Bogardus, and was used extensively in the buildings which he erected, for instance, the Harper building. It is so constructed that the weight of the cast-iron portion of the girder, and its burden, is mainly born by the wrought iron tension rod. He reasoned that the strength of wrought iron could be estimated while that of cast iron could not.

The second plan of building which he devised was carried into practice in the Baltimore *Sun* building. The iron front of the building on Broadway, occupied by Milhau, the druggist, was put up in a single day.

With the advancement of the business and the increase of competition, many economical devices have been introduced not always legitimate in their character. So wide a field is there for deception on the part of constructors in this business, that a number of

BUILDING LAWS

have gradually been enacted, designed to prevent the public from being imposed upon and to insure security of life and property. Some of these questionable expedients we may speak of briefly in this place. It is a common practice in the construction of cast iron columns, beams, girders and lintels to give them a greater thickness at the ends than at the middle. A column, for instance, is made at the ends of the thickness called for in the specification, but beginning at a short distance from the extremities the thickness of material diminishes to the middle of the column where it is the least. This is done to save metal and deceive the inspector. The only way to discover this fraud is to drill holes through the metal, which is a very expensive process and impairs the strength of the column. The constructor has also great facility by the use of paint for covering up defects in the beam, lintel, column or girder. Such pieces, for instance, may be made of poor metal, with sand holes or other imperfections, which may be concealed with a cement, in common use among iron workers, and which becomes nearly as hard as iron. It is almost impossible to detect such a deception except by the closest scrutiny and a vigorous use of the hammer and chisel. Another objection which the inspector urges against the present practice of iron construction is the introduction of beams, lintels and girders of new forms, devised and used without a previous knowledge of their sustaining weight. He records the failure in one year of two newly invented lintels. One was marked to sustain 180 tons and broke at 53 tons. In cases in which such lintels have been used without previous test, he has ordered intermediate columns to be placed between the extreme supports to relieve the lintel of a portion of the strain to which it is subjected.

THE FIRE LAWS

which have been introduced to render buildings more nearly fire-proof were adopted very slowly and met with great opposition. They were first applied as an experiment to the fire limits included between Chatham street, East Broadway, Grand street and the North River. The limit was next extended to 14th street, and from the North to the East Rivers. They were afterward extended to 23d street; next to 34th street, then to 42d street, afterward to 52d street, and finally to include the whole island. Among the objects covered by this law was the introduction of fire-proof cornices. The facilities for the extension of conflagrations offered by wooden cornices led to the invention of fire-proof cornices, which combine safety with superior architectural finish. In 1866, a law was enacted in New York requiring fire-proof cornices and gutters to be placed upon all buildings thereafter to be erected, and that all decayed or damaged cornices be replaced with those of fire-proof material. An instance illustrating the necessity of this law occurred in a fire in 6th avenue and 45th street, in which the flames extended across the street and caught on the wooden cornices of the buildings opposite.

The law also requires the use of iron shutters on warehouses, but when this ordinance was enacted it met with great opposition, and was regarded by some as very oppressive. One party bricked up the windows of a valuable house in preference to putting on iron shutters against his will. The history of this regulation is somewhat curious. The first law required iron shutters only on new buildings; the next required them also on old buildings; finally, on account of the occurrence of several casualties from the omission to close the shutters, an amendment was enacted compelling all persons to close the shutters of their buildings after business hours. It required three years of experience, therefore, to obtain a perfect law. A fire occurred some time ago at 202 Broadway, in which a building was destroyed. The flames gained access to it from a burning building on Fulton street, through its unprotected windows in the rear, while other buildings equally exposed, being protected by iron shutters, escaped. The saving of some valuable warehouses on Catharine Lane, during the burning of Appleton's buildings, was due to the protection of iron shutters.

(To be continued.)

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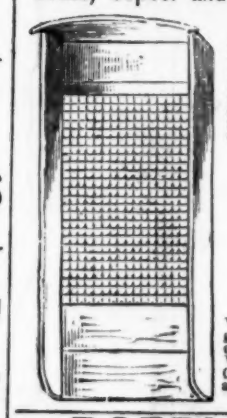

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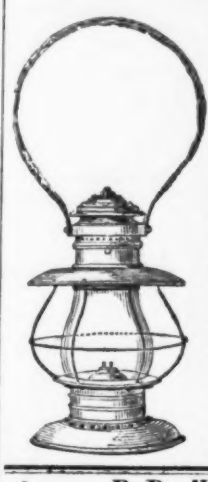

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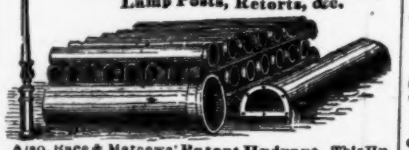

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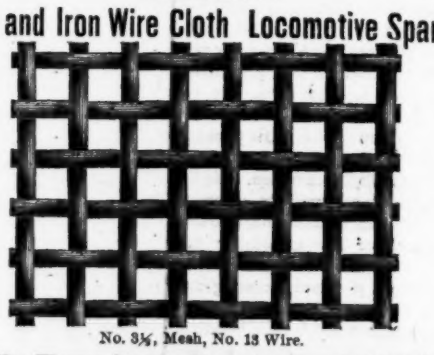

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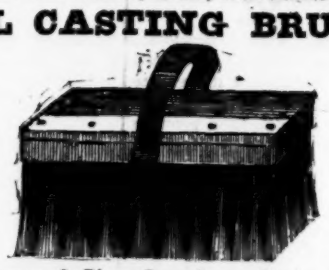

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Z. S. Durfee, Esq., secretary and treasurer of the Pneumatic Steel Association, has compiled the following important memoranda about the use of steel rails, from the annual reports of railroad companies of the United States and Canada for 1873:

The Eastern Railroad of Massachusetts has laid 2507 tons steel rails in 1873, and has now 43 miles of steel track. The Boston and Albany Railroad has used 6000 tons of steel rails in renewals. The New York, New Haven and Hartford Railroad has received 2500 tons of steel rails, which will be used to complete the substitution of steel for iron, both on the main line and on the Shore Line division.

The Grand Trunk Railway of Canada has now 520 of 1377 miles of line laid with steel, concerning the durability of which Mr. Potter, the president, spoke as follows at the late annual meeting: "Let me tell you a very curious little incident respecting the life of a steel rail. We have got on our line near Kingston half a mile of steel rails, which were laid down in the year 1865. We have got that half mile of steel rails on the most crowded part of our line, laid down in 1865, therefore over which eight summers and seven winters have passed. Now, not one single rail of that 60 or 70 tons has been changed, nor is there any appreciable sign of damage or wear and tear, except that the whole surface is smooth. We had those rails carefully examined and measured by a very delicate instrument. There is no sign of any wear of any kind whatever; none of them have broken—none of them are in any way touched, except that they have a perfectly smooth and even surface; and this instrument shows that, if the wear and tear of the rail continues as it has done for the last seven or eight years, those rails will last for 180 years. I tell you what the instrument shows—of course, you must not suppose that I mean to tell you that they will last that time; but that is the simple fact—there is no appreciable wear and tear."

The report of the chief engineer of the Philadelphia and Reading Railroad, for the year ending with November last, states: "The introduction of steel rails on the main line commenced in September, 1865; and since that time 8374 tons have been laid, of which 13 tons—being experimental rails and not proving satisfactory—were removed from the track. At one of the most trying places in Reading, forty-one tons of steel rail were laid in August, 1867, at a point where the life of an iron rail never exceeded four months; and after having done service for six years they were removed in the fall of 1873, having been worn off uniformly to a thinness not considered suitable to the main track. These rails have been placed in sidings, where they will do duty for some years. There are now 8301 tons of steel rail in our tracks, showing that only nineteen tons were removed from causes of either accidents, dents or defective manufacture."

The Lehigh Valley Railroad, of Pennsylvania, has now 93·12 miles of track laid with steel rails, of which 10·92 miles were laid during 1873. The Pennsylvania Central Railroad used 16,760 tons of steel rails in 1873. The Philadelphia, Wilmington and Baltimore Railroad's renewal of rails is being made altogether with steel, and there are now 110 miles of track laid with steel rails. The Michigan Central Railroad has all of the old line except 65 miles now laid with steel, and its double track is all steel.

The Ohio State Railway Commissioner for 1873 states: "The companies report 756 miles of steel rail in use on their lines, or more than one-tenth of the entire mileage. The greater portion of this is within the State, making about one-eighth of our main lines supplied with steel rail. That this is the economical rail upon thoroughfares subjected to a large traffic, not only on account of its durability, but its power to withstand extreme cold and changes of weather, has been practically demonstrated. * * * There have been laid upon the roads of the State within the year 238 miles of steel rail, 558 new iron, 553 of re-rolled, and 212 miles spliced and mended rails—making a total of 1561 miles of track."

The Illinois Central Railroad president's report states: "4645 tons of steel rails were used in renewals, and the excess in cost over iron rails was charged to permanent expenses. About 68 miles of the road are now laid with steel rails. It is proposed to relay with steel rails, as renewals are needed, all the track now laid with iron rails between Chicago and Gilman, Carbondale and Cairo, Forreston and Dunleith, and several shorter sections in Illinois, and between Dubuque and Farley, in Iowa; in all, about 230 miles. To do this will require 22,000 tons of steel rails in the next three years."

The Chicago, Burlington and Quincy Railroad Company, during the year 1873, laid 21·39 miles of steel rails in Iowa, and 44·17 miles in Illinois, making 199·71 miles now in track. The Chicago and Alton Railroad Company's president's report states: "The continued substitution of steel in place of iron rails, as the latter become worn out, is deemed no longer an experiment. It is fully demonstrated to be true economy. We have 106 miles of single main track and 66 miles of double track laid with steel rails."

The Chesapeake and Ohio Railroad laid the larger portion of its mountain track with steel rails.

The Canada Southern Railroad has been laid entirely with steel rails. The New York Central and Hudson River Railroad Company publishes no report, but it is well known that all the Hudson River track is now steel, that all the new double track of the New York Central is to be of steel, and that the company is committed to the use of steel for all its renewals of main track.

This list of abstracts could be extended so as to include reports for all the leading railroads of the country; but the foregoing shows conclusively that the day of iron rails on all railroads doing a large business has passed.

It is also becoming worth the consideration of all railroad companies how far it may be possible to approximate the cost of a steel track to that of an iron track by giving the steel rails a diminished weight per yard proportioned to their greater strength and safety. It is now generally admitted by experts that a steel rail may be fully one-fifth lighter than an iron rail for equal safety, while the vastly less wear of the steel rail makes its proportionate strength continue very much longer than that of an iron rail. For instance, a 45 lb. steel rail is as safe as a 56 lb. iron rail, and where a new railroad company proposes at outset to lay down a light track, it will find if it lays down a steel track, and its business increases within ten years so as to require a heavier track by reason of the employment of heavier trains, the steel rails when taken up will be so little worn as to be worth nearly the price of new rails for any road wanting rails of like weight, while it will have had in the meantime a track which, by its greater smoothness and generally more perfect condition, will have saved in wear and tear of rolling stock alone much more than the increased original cost of the steel rails.

The question has been raised, what will be done with worn and broken steel rails? As steel in any form is worth more than iron, the ordinary laws of trade and manufacture will very speedily settle this point. All makers of steel rails accept them in exchange for new at a fair price; but, inasmuch as steel rails do not, during wear, disintegrate or split up as iron does, they will, so soon as there are enough old ones in the market to warrant the special preparation for treating them, growing out of their superior density and hardness, become more valuable for being rolled into various merchant shapes for which they are suitable, than for being remelted into rail steel. They are now rolled down into carriage tire, wire billets, merchant bars and rods of small sizes, into spring steel, shovel strips, etc., etc., and so soon as they become, to any extent, an article of commence, they will bear a higher price, relatively to their first cost, than old iron rails ever have done, and be more universally in demand.

The following companies are now making steel rails in the United States, to whom communications about prices, specifications, etc., are respectfully recommended: John A. Griswold & Co., Troy, N. Y.; The Bethlehem Iron Company, Bethlehem, Pa.; The Cambria Iron Co., Philadelphia, Pa., and Johnstown, Pa.; The Pennsylvania Steel Company, Philadelphia, Pa.; The Cleveland Rolling Mill Company, Cleveland, Ohio; The North Chicago Rolling Mill Company, Chicago, Ill.; The Union Rolling Mill Company, Chicago, Ill.; and the Joliet Iron and Steel Company, Chicago, Ill.

Friction Matches.

"What should we do without matches?" is a question which might be easily asked, but which it would be difficult to answer satisfactorily. And yet they are of such recent introduction that many who would not like to be classed among the "old people," or to be spoken of as belonging to the "last generation," well remember the tinder box, with its flint and steel, and, perhaps, retain vivid recollections of barking the knuckles in striking sparks which were subsequently and laboriously formed into flame to kindle the fires or light the candle. For a period of fifty years the most determined efforts were made to get rid of the old tinder box, and the number of contrivances adopted was very large. Mixtures of sugar and chlorate of potash, which ignited by a drop of sulphuric acid, suggested the "oxymuriate matches." These were inflamed by thrusting a splint of wood dipped in sulphur, and covered with the mixture, into a bottle containing asbestos, saturated with the acid. When this form of match first came upon the market, they sold as high as two dollars the box, each containing fifty matches. The rapid combustion of chlorate of potash and sulphide of antimony when made into a paste and dried, and subjected to friction, suggested the lucifer match. These forms of matches, together with many others manufactured prior to 1834, were all disagreeable and dangerous, and they were also too expensive for common use. About 1834 the happy idea was suggested by an English chemist that phosphorus might be safely substituted for the sulphide of antimony in the construction of matches, and soon afterward it was ascertained that a phosphorus paste, in which the antimony was omitted altogether, afforded the cheapest and best match. It was found that a simple splint of soft wood, first dipped in melted sulphur, and then in a paste made of phosphorus and glue, with a little fine sand and red ochre, supplied the most convenient, cheap, and safe match that could possibly be devised. This is the match which has held its place up to the present time, and is in common domestic use in all parts of the civilized world. To prevent this match from igniting spontaneously, or by handling, a film of gelatine covers the phosphorus paste upon the end, and it is only when this is disrupted by friction that the phosphorus is reached and ignited.

The Dutch chemist, Brandt, who laboriously drew forth phosphorus in minute quantity, and by a tedious process, from liquid excrement, little thought that his chemical novelty would in after time be manufactured by hundreds of tons, and be not only found in every household, but made the kindling-spark of all hearths in every civilized country. One of the largest manufacturers of phosphorus in Europe has stated that the whole stock of the article in the chemical establishment where he was trained, consisted of a little stick two inches long. He has lived to see it pulled by his own machinery in a cord uncounted miles long, and dispatched by the ton together, for use in both hemispheres. The chemist still lives in London who first produced phosphorus for use by the friction match manufacturers, at $2500 per pound. Now demand and competition have reduced the price so low that a single pound can be bought in this city for about one dollar. The article is not made in this country, but we can see no reason why it may not be, as we have the necessary materials, bones and coal, in abundance. The production of phosphorus (which is now obtained from bones) requires a large consumption of fuel. At least 100 pounds of coal are required to secure one pound of the element, and the intensity of the heat is such as to rapidly destroy apparatus. The labor, also, is not only disagreeable, but dangerous; as, through inattention, fearful explosions of the retort sometimes occur.

It was at one time feared that the demand for bones, for agricultural purposes, would so enhance the cost and diminish supply, as to raise the price of phosphorus to a high point. But the discovery of the immense deposits of phosphatic rocks, in this country and elsewhere, has set at rest all apprehensions of this nature. We have phosphorus enough quietly resting in South Carolina rock beds to meet the demands of the world for thousands of centuries, and no one need be anxious concerning a full supply, at cheap rates, of the indispensable friction matches, during his own lifetime at least.

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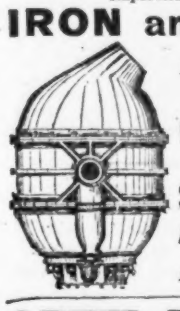
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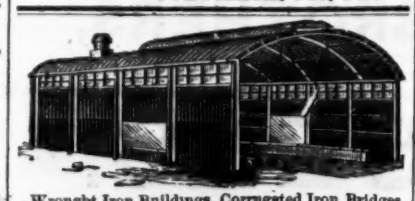
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New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN THE MANUFACTURE OF IRON AND STEEL.

Specification forming part of Letters Patent No. 147,819, dated February 24, 1874, issued to William Bushnell, of New York:

Figure 1 presents an external view of a vessel to be used for converting large charges of crude molten iron into wrought iron or into steel. Fig. 2 represents a vertical section of the same vessel, showing the outer casing, or shell, letter A, the fire-brick lining, letter B, and the wooden lining, letter E. Fig. 3 represents a blast, or blow pipe, the lower portion of which, letter F, is made of wood, and the upper portion, letter G, being made of iron. Fig. 4 represents a smaller decarbonizing vessel, or bloom mold, made of cast iron, letter A, with a wooden lining, letter E. Fig. 5 represents a vertical section of the same vessel, or bloom-mold, showing more clearly the bottom and side lining, letters E, E. Fig. 6 represents a transverse horizontal section of the same vessel, or bloom-mold, showing how simply and firmly the wooden lining, letter E, may be fitted in the vessel. Fig. 7 represents another small decarbonizing vessel, or bloom-mold, made of common sheet iron and lined with wood, in same manner as Fig. 4. Fig. 8 represents a transverse horizontal section of the same small sheet iron vessel, or bloom-mold, showing more distinctly the wooden lining, letter E. Fig. 9 represents an iron band, intended for clamping and binding the two halves of the cast iron vessel, Fig. 4, together when in use.

Similar letters of reference indicate corresponding parts in all the figures.

The outer casing, or shell, of the large decarbonizing and purifying vessel, Fig. 1, and which is intended for converting large charges of molten cast iron into wrought iron or into steel, is made of boiler plate, properly fashioned, and well riveted together. The smaller vessel, or bloom mold, Fig. 4, is of cast iron, and in two equal vertical sections, the dividing line being through opposite diagonal corners, as represented in letters *m*, *m*, in Figs. 4 and 6, this division of the vessel being intended to facilitate the removal of the bloom when properly converted from crude iron, and sufficiently cool to be put under the hammer or for reheating. These cast iron vessels are intended for making any desired size or weight of blooms, from one hundred pounds to one thousand pounds, or more, and must be made heavy and strong, capable of being used a great many times.

The small sheet iron vessel, or bloom-mold, Fig. 7, is intended for producing but a single bloom of ordinary size and weight; it is made of common sheet iron, properly seamed or riveted together.

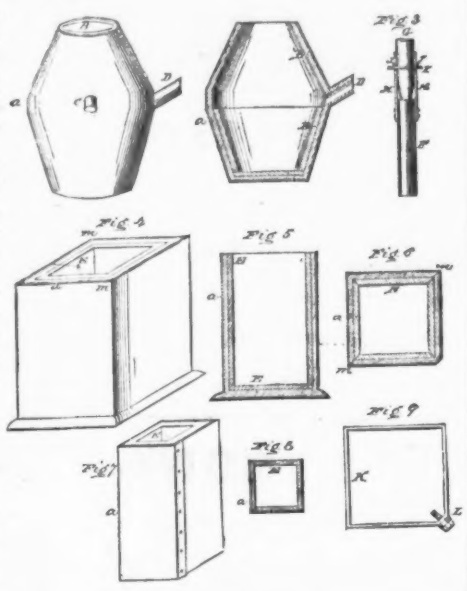
The shell, or casing, of the large decarbonizing vessel, Fig. 1, is lined, first, with a fire-brick lining, letter B, and within such lining a wooden lining, letter E, of from one to three or more inches in thickness, according to the comparative fire resisting qualities of the wood used.

The smaller vessels, or bloom-molds, Figs. 4 and 7, are lined with wood only, as thick as may be best suited to the precise character or quality of the product sought for.

The large decarbonizing or purifying vessels are arranged so that they may be handled and moved with the aid of a crane, or other labor saving or assisting device, and so that they may be tipped or tilted at any necessary angle for receiving the crude molten metal, and for pouring out from the spout, D, or discharging from the upper end of the vessel the converted metal into molds, or forms, or upon heavy fluted or grooved cast iron plates, the flutes, or grooves, of such plates being of sufficient width and depth to divide and form the mass of converted metal, while it is still liquid or semi-liquid, into ingots or blooms suitable for reheating, or for passing directly through the squeezers, or under the hammer, or through the rolls, as may be desired. The cast iron vessels, or bloom-molds, Fig. 4, may be arranged with a ring, or staple, cast into the upper end of each of the two divisions, which will facilitate the handling of them. The small sheet iron bloom-molds need not be provided with any special means for handling, as they are intended to retain the decarbonized and converted metal until it is sufficiently cool to pass the mass, the vessel itself included, into the squeezers or under the hammer, or the mass may be laid by for reheating. The cooling of these molds and their contents may be accelerated by dashing the outside with water when the lining shall be nearly or quite burned out.

The blast or blow pipe, Fig. 3, is more especially designed for use in the large decarbonizing and purifying vessels; but it may also be used to great advantage in converting the charges in the smaller vessels from cast iron into wrought iron, or even into steel, as, by its use, much less solid decarbonizing matter will be required to make the conversion, and a purer metal will consequently be produced. It may also be used for converting the molten cast iron into wrought iron or into steel, without the addition of any solid oxygen-bearing substance, substantially as in the Bessemer process. The wooden part of this blow pipe is made of any good, sound stick of timber of suitable size, by boring a hole longitudinally through its center, as for an ordinary pump log, graduating the size or diameter of the bore according to the quantity and force of the blast intended to pass through it. The bore in the upper end of this pipe is reamed out in a flaring shape, so that the lower end of the iron pipe, letter G, by being cast tapering, may be readily thrust into it and make an air-tight joint, as shown in Fig. 3. The two portions of the blow pipe are then, when prepared for use, firmly anchored together by means of the iron straps H, H, which are properly spiked or fastened to the wooden pipe, and which pass upward and through the flange, letter *i*, of the iron pipe, and are there keyed fast by the keys J, J.

The object of using a wooden blow pipe is, of course, the same as in using a wooden lining in the vessels and molds—to preserve and, if possible, to increase the temperature of the liquid metal. The wooden lining and the wooden part of the blow pipe will necessarily be destroyed in converting a single charge of molten cast iron, but the expense of such lining and such blow pipe is very trifling in comparison with the advantages gained by their use.



The mechanical arrangements for commencing the converting of iron being completed, and the ore being properly prepared and crushed to a size not coarser than ordinary grains of buckwheat (the finer the better), the large decarbonizing and purifying vessels is charged with the proper quantity of molten cast iron drawn direct from a blast furnace or from a cupola furnace, and at the same moment the wooden blow pipe is inserted vertically in the liquid metal, carrying the lower end of the pipe down to within a few inches of the bottom of the vessel, and applying the blast with a force and pressure sufficient to overcome the specific gravity of the liquid iron, and to force the air out among the particles of, and up through the surface of, the iron, and at the same moment commence gradually introducing into the vessel, and commingling with the molten crude iron, such quantity of the prepared iron ore as may be necessary, in connection with the blast of atmospheric air, to decarbonize and convert the crude iron into wrought iron, or into steel as may be desired. A small portion of the iron ore intended to be used in the charge may be deposited in the bottom of the vessel before charging it with the molten cast iron, and the balance introduced as first stated.

The object of combining a blast of atmospheric air with the iron ore in this decarbonizing and converting process, is for the double purpose of increasing the temperature of the liquid metal as decarbonization progresses, and for assisting, by means of its oxygen, such decarbonization and consequent conversion of the mass of crude iron and iron ore into wrought iron and into steel, as may be desired.

Substantially the same procedure will apply to the conversion of molten cast iron into wrought iron blooms in the smaller vessels, Figs. 4 and 7, in case the blow pipe is used in them; but in case it is not used, then an extra percentage of iron ore will be required to perfect such conversion. The blast of air in the large vessels will sufficiently incorporate and mingle the iron ore with the crude iron, without other device. But when the blast is dispensed with, in the smaller vessels, it will be needful that the ore shall be commingled with the iron by means of a small wooden rabble; or a small wooden paddle will answer.

No precise weight or percentage of iron ore can be fixed upon for use in all cases in this process, because of the variable percentage of oxygen found in different ores; but, as an approximation, it may be stated that of ordinary magnetic oxide of iron, yielding from sixty to sixty-five per cent. of metallic iron, from twenty-five to thirty per cent. may be advantageously used in converting molten cast iron into wrought iron, and from ten to twenty per cent. for converting the same grade of molten cast iron into an ordinary steel

Claim.—1. Wooden lined vessels and molds for improving, purifying and refining molten crude iron, and for converting the same into wrought iron and into steel.

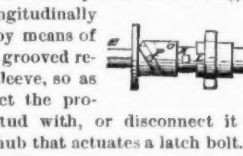
2. A wooden blast or blow pipe, for conveying and blowing a blast of atmospheric air into molten crude iron.

The following patents were lately issued for inventions of interest to our readers:

FLAT IRON HEATER.

To Hiram C. Stouffer and Landon Masten, Canfield, Ohio.—The heating shell is adapted for a single flat iron, and is portable by means of the handle of the iron.

Claim.—The portable metallic sad iron shell B, conformed to the shape of the said iron



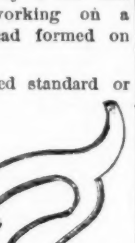
and provided with a hinged door, E, and key pin, *z*, for securing said door.

SNAP HOOK.

To Peter Burns, Syracuse, N. Y.—*Claim.*—In a snap hook, the combination of bar, having rib on its reverse side, spring F, slot D, and advanced bearing surface.

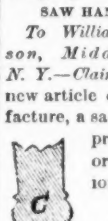
ADJUSTABLE CATCH FOR LATCHES.

To George W. Burr, East Line, N. Y.—*Claim.*—The T-shaped catch C and slotted holder B, combined and constructed relatively, as shown and described, so that the former may be clamped and held by friction between the post A and said holder by means of screws.



LOCK-BOLT AND STRAP FOR TRUNKS.

To Robert Hilton, Cincinnati, Ohio.—A bolt perforated at its upper end to receive a ring, and at its lower to receive a padlock, is passed through two sockets, one of which is secured to the lid and the other to the body of a trunk. A strap is fastened to the trunk below the under socket, leaving space for the pad-lock, and the ring may be turned downward, the free end of the strap passed through it and buckled, thus forming a double fastening.



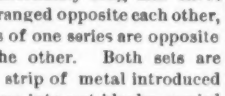
Claim.—The arrangement, in a travelers' trunk, of bolt E, link F, sockets C and D, and strap and buckle.

REVERSIBLE KNOB LATCH.

To Samuel A. Wilford, Norwich, Conn.—*Claim*—The lever E, pivoted to the slide G, yoke F, and reversible latch-bolt B, D, in combination with the stop K, or its equivalent.

KNOB LATCH.

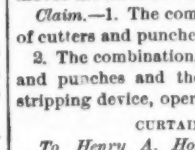
To Walter Varah, New Haven, Conn.—A sliding sleeve, provided with a projecting stud, is fitted to a knob spindle and arranged to be moved longitudinally thereon by means of a spirally grooved revolving sleeve, so as to connect the projecting stud with, or disconnect it from, a notched hub that actuates a latch bolt.



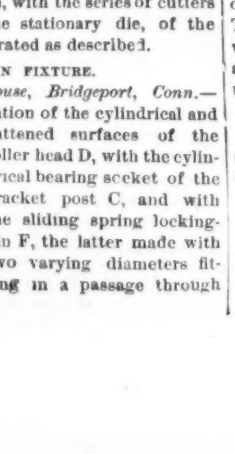
Claim.—The combination, with knob spindle E, and loose notched hub F, of the sleeve I, having stud K and pin P, and the spirally grooved sleeve O, having head Q.

DOOR BELL.

To David Mosman, West Meriden, Conn.—The force with which the hammer strikes the bell is regulated by a nut and washer, working on a screw thread formed on the actuating rod.



Claim.—The bent and slotted standard or bracket B, the bent bell hammer D, the screw rod E, and the adjusting nut G, and its washer or jam nut H, constructed and arranged to operate in connection with the gong A.



SAW HANDLE.

To William Clemson, Middletown, N. Y.—*Claim.*—As a new article of manufacture, a saw handle provided with a continuous circular or segmental slot G, to form provision for the use of one or both hands.

CASTER FOR FURNITURE.

To James I. Crooker, Norwood, Mass.—*Claim.*—The projections *a*, the screw B, and the disc D, arranged and combined with the caster A and the recessed leg C.

MACHINE FOR MAKING METALLIC NUTS.

To Henry Reynolds and Richard T. Barton, New Haven, Conn.—Two series of alternately long and short dies are arranged opposite each other, so that the short dies of one series are opposite the long ones of the other. Both sets are operated so that a strip of metal introduced between them is cut up into nut blanks, carried into a rectangular opening in a stationary die, swaged and punched, the dies on one side having longitudinal openings for the passage of the punches, and those on the other side having similar openings for the metal punched out. A stripper situated above the punches removes the finished nuts.

Claim.—1. The combination, with the series of cutters and punches, of the stationary die.

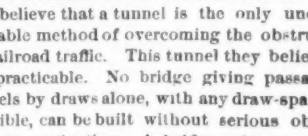
2. The combination, with the series of cutters and punches and the stationary die, of the stripping device, operated as described.

CURTAIN FIXTURE.

To Henry A. House, Bridgeport, Conn.—*Claim.*—The combination of the cylindrical and flattened surfaces of the roller head D, with the cylindrical bearing socket of the bracket post C, and with the sliding spring locking-pin F, the latter made with two varying diameters fitting in a passage through the said post.

TRY SQUARE AND BEVEL.

To George C. Miller, Detroit, Mich.—*Claim.*—



The bevel square described, wherein the handle A, blade B, Wedge C, tail-screw D, and nut E.

Lake Superior Furnace Notes.

The Marquette *Mining Journal* says: The Morgan furnace, having received a thorough overhauling, will go into blast on Monday or Tuesday next.

The Deer Lake Iron Company are putting in a new saw mill, with machinery from the works of W. H. Hiner & Co., Fond du Lac.

The Elk Rapids Furnace, on Grand Traverse Bay, is said to be doing good work, making from 25 to 30 tons per day. It is a charcoal furnace, 9½ by 40 feet.

Stack No. 1 of the Pioneer furnace has been blown out, on account of the scarcity of coal. No. 2, however, is doing good work, making from 27 to 30 tons a day.

The damage to the Champion Furnace by the recent fire is estimated at $25,000, upon which there was no insurance. It is not definitely known whether the company will arrange for the immediate rebuilding of the furnace or not, but with the present depressed state of the iron market it may be considered doubtful.

A correspondent of the Detroit *Tribune* announces the sale of the Carp River Furnace, in Marquette, to the Peninsular Iron Company, of Detroit. The sale, which was made last January, was in the nature of a consolidation, the property of the Carp River Company being transferred to the Peninsular Company at a valuation of $140,000, the consolidated company having a paid up capital of $360,000, of which the Carb River stockholders hold $140,000. The property of the company here consists of the furnace plant of 456 acres, six square kilns at furnace, and a tract of timber lands down the bay. The officers of the consolidated company are John Burt, president; Solon Burt, secretary and treasurer, and N. W. Gray, manager of the furnace here. The Carp will go into blast next week, with a sufficient supply of charcoal for a year's run.

Allen's Improved Drilling Machine.

We have received a specimen of drilling in wood, the work of an Allen Improved Drilling Machine, an invention which demonstrates the practibility of drilling or boring in metal or wood a large number of holes at one and the same time, and in the closest proximity consistent with strength, without splitting or cracking the interviewing solid partition between each hole. The fault in machines intended for this purpose, hitherto invented, has been, that when the holes were bored or drilled by them, in close neighborhood to each other, the intermediate wood or metal has generally split during the process. In Mr. Allen's invention this difficulty is very ingeniously overcome by a system of cranks placed at an obtuse angle, and so arranged that the lines of holes to be drilled may run in the desired direction. The unarmed ends are inserted in a driving plate which revolves on an eccentric with whatever "throw" is required. The drills are placed in the opposite end of each crank and revolve with it. Any gradation of power can be applied to each and every drill, and a removal or change of any or all of them does not effect the working of the machine.

The wide applicability of these machines is one of their chief recommendations, for anything, from a tooth brush to a boiler flue plate, can be drilled or bored by them. They will, moreover, thread nuts and bolts in any number which the size of the machine will accommodate, and they can be so constructed as to thread nuts on one end and bolts on the other, and the wood boring machines drill at both ends of the crank. This invention seems destined to become very useful in iron working, especially in boiler making.

The Detroit Bridge.—The report of the commissioners appointed by the Secretary of War, to inquire into the feasibility of bridging the Detroit River, has been laid before Congress. The commissioners have given a hearing to all parties interested, and have collected statistics bearing on the question. They are inclined to think the water traffic much more important than the railroad traffic which crosses the river, and believe that a tunnel is the only unobjectionable method of overcoming the obstruction of railroad traffic. This tunnel they believe to be practicable. No bridge giving passage to vessels by draws alone, with any draw-span now possible, can be built without serious obstruction to navigation. A bridge giving a clear headway of 150 ft., and clear spans of 400 ft., would not seriously obstruct navigation, but would be very expensive, and the approaches would be long, and very inconvenient to construct. A third plan considered was a bridge for winter use only, resting on pontoons in the center of the river, and piers at the sides, which could be removed so as to leave a clear opening of 700 ft. during the season of navigation. This the commission believes could be built without serious hinderance to navigation, and at a reasonable cost, but it would only be of use some five months of the year.

The New Castle *Guardian* of the 21st inst. says: Work in the rolling mill, nail factory, brick yards, &c., connected with the Shenango Iron Works was suspended on Saturday last. The cause of suspension, we are informed, was brought about by some of the workmen refusing to take scrip as part pay in the future. For the benefit of the entire community we trust the suspension will be of short duration.

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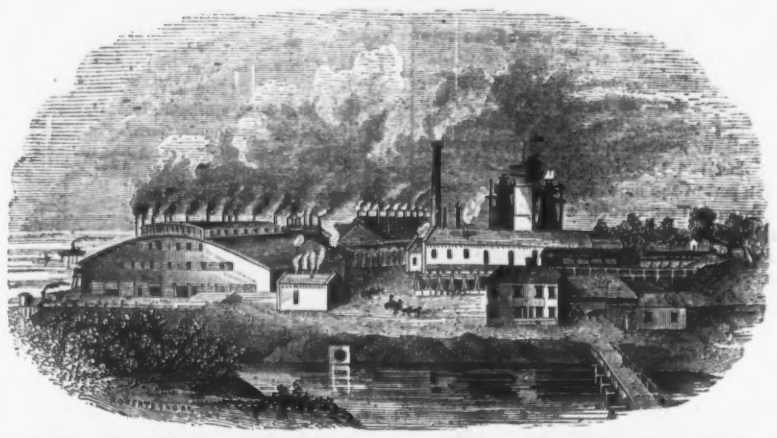

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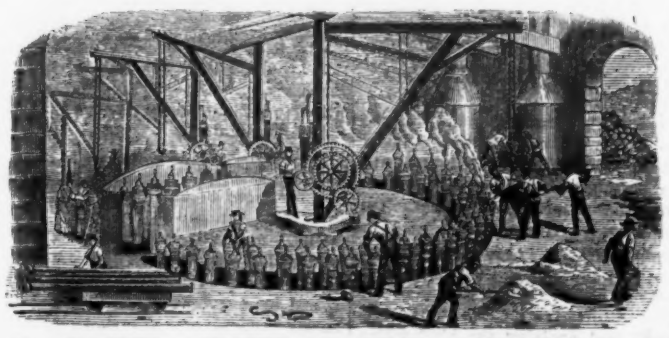

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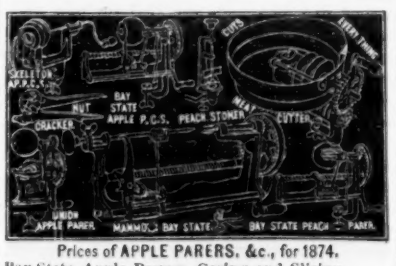

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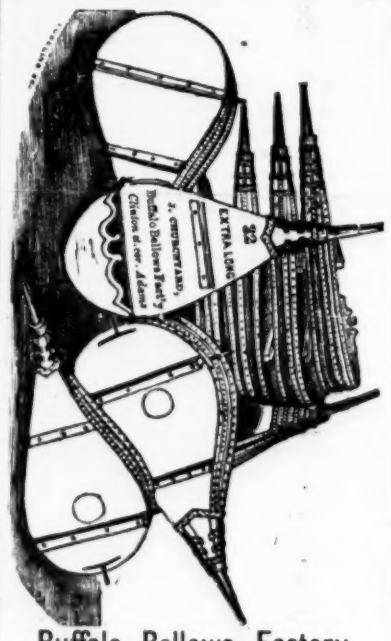

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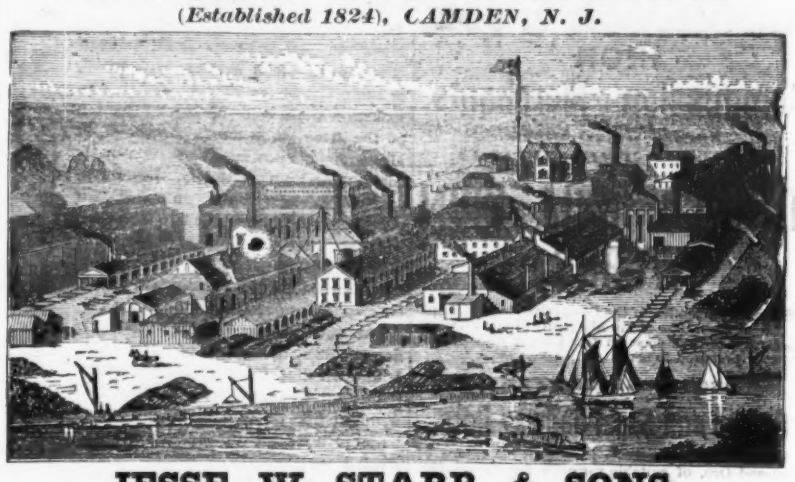

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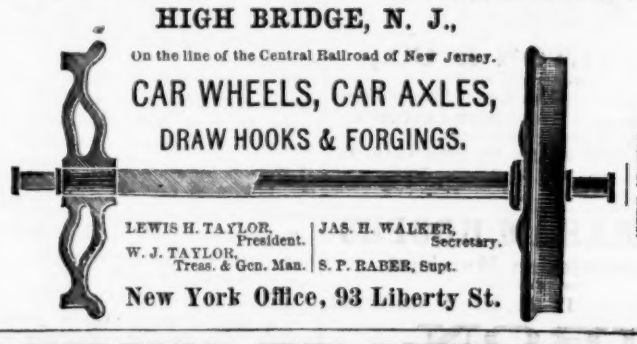

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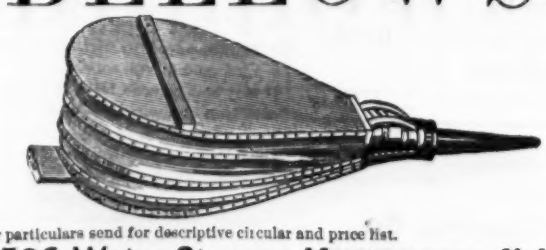

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FOUNTAINS.

How Fountains Should be Set.

II.

The ground basin is usually made of iron, brick, cement or stone, of a depth varying from 8 to 18 inches, and 3 or 4 feet larger than any of the upper basins. When of iron up to the size of 6½ feet in diameter they are generally in one piece, but when they exceed that size they are cast in segments and jointed in the same way as a tank. For large fountains the rim only need be of iron, puddled clay or cement being used to form a bottom. A ground basin of stone, brick or cement is sometimes cheaper than one of iron.

Figure 1 shows the kind of basin required. If meant to hold a large fountain the center should be firm enough to bear its weight. Holes should be provided as indicated for the supply and waste water pipes. It should be borne in mind that the diameter of the waste pipe should exceed that of the supply pipe, and the water surface be one or two inches below the basin's rim. A bricklayer, or builder, who understands his business, should be able to make a stone, brick or cement basin and render it water-tight. After the basin is laid, the erection of the fountain is an easy task, as duplicate marks are placed upon the joining parts when they are sent out from the foundry. A drawing of the fountain in a complete state (if it is a large one) also frequently accompanies it when sent out, which renders the process of erection still easier. Stones or bricks are usually placed about the base of the structure, as in Fig. 1, to give it a support, although fountains of a hight of seven feet and a lesser altitude are frequently made to rest upon iron standards, shown by the letters A, A, which usually come with the fountain. The ground basin having been laid, the fountain may be set in its place, previously leaving the end of the supply pipe standing up to point B, in order to allow the pipe forming part of the fountain, and projecting slightly below its base, to join it, which it does by means of an ordinary junction socket at B. For this purpose the brick base or iron standards should be wide enough to allow the workman's hands to enter. After the fountain has been placed in the ground basin, and before the supply pipe is connected, it should be positively ascertained, by the use of a spirit level, that the upper basins of the fountain are perfectly horizontal, as if they are not the water does not drip evenly from their surfaces, which sadly mars the general effect. The level should be taken several times in the gradual process

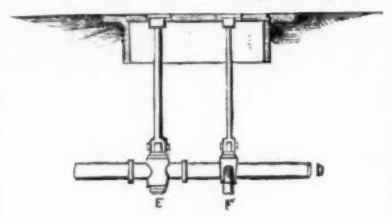

Fig. 2.

toward completion of the work. Wedges of hard wood or iron, driven beneath the basin of the fountain, may be used to make the necessary alterations in the level. This done the pipes may be joined and tightened, placing a little white lead on the uniting screws. As the jointing may again affect the level a final adjustment should then be taken.

TAP ARRANGEMENT.

The workman who erects the fountain should remember that between the reservoir and the fountain there must be a tap (C) to regulate the water supply. Where liable to become frozen, the pipes should be emptied or they may burst. The arrangement of taps shown in Fig. 2 is a good one, both for supply and escape.

The pipe D supplies the fountain, and the tap E regulates the supply. In order to empty the pipes, tap E is closed, tap F is opened and the water runs off. For working the taps, lever rods are used, which are inclosed in a box of cast iron let into the ground at some point between the reservoir and the fountain. On the cover of the box may be placed a brass index, showing how much the taps are open, if at all.

FURTHER UTILITY OF THE WATER SUPPLY.

When laying the supply pipe of a fountain, it may also be utilized to provide water for a garden or to put out a fire.

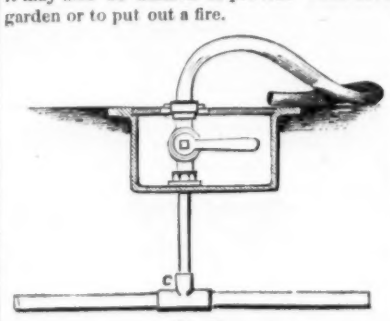

Fig. 3.

This is shown in Fig. 3. The "T junction" C is inserted in the supply pipe, and communicating with a tap and union joint, indicated in the cut, allows ordinary hose to be connected. To protect the tap and union they are inclosed in a cast iron box sunk in the ground.

We think it has been made apparent from the foregoing brief description of artificial fountains, and the mode of erecting them, that their construction in metal has not only greatly cheapened the articles themselves, but has immeasurably lessened the trouble and cost of putting them in running order. When the pleasure that these graceful objects afford is contrasted with the small expense at which it may be enjoyed, we see no reason to doubt that as their cheapness becomes known, they will acquire, in this country the wide-spread popularity they have obtained abroad, and which they so amply deserve for their beauty and economy.

Iron Trade Gossip.

The following notes from the correspondence of the Secretary of the Iron and Steel Association are interesting:

Messrs. C. Knap & Co., of Roaring Spring, Blair county, Pa., write us as follows: "Rodman furnace, No. 1, was successfully blown in March 17th. It is 42 feet high with 9 feet bosh; daily production, 9 to 11½ tons of 2268 lbs.; fuel, coke; product, red short iron from all Bloomfield brown hematite ore."

W. E. Johnston, superintendent of Brierfield furnaces, Alabama, says: "The older of these furnaces was built in 1862, and the other in 1864, by C. C. Huckabee & Co., and were afterward sold to the Confederate government. They were destroyed by the Wilson raid. At the close of the war the property was confiscated, and bought by the Brierfield Iron Works Co. This company also owns a rolling mill with a capacity of 10 gross tons per day, now standing idle."

A. Wilhelm Esq., attorney for R. W. Coleman's heirs, Cornwall, Lebanon county, Pa., gives the following news: "Two anthracite furnaces, Bird Coleman, owned by R. W. Coleman's heirs, and North Cornwall, owned by Mrs. M. C. Freeman, will be blown in this spring."

B. A. M. Froiseth, of Salt Lake City, Utah Territory, explains, in a letter dated April 2d, how iron ore is used in that region: "Iron ores, Wyoming hematites, have been and are still imported into Utah to be used as flux in reducing other ores in the numerous smelting works operating throughout this Territory. During the year 1873 over 6000 tons of Wyoming ores were brought into Utah for this purpose, worth in Salt Lake City from $16 to $20 per ton. The cause of this large importation is that in Wyoming the mines are situated near the line of the Union Pacific Railroad, and consequently the ores are transferred at little cost, while the principal iron deposits discovered in Utah are out of the way of railroad transportation. There can be no doubt that Utah is destined to become the greatest iron producing country in the world, and also a great manufacturing center when rail communication is once established."

A prominent Tennessee manufacturer, S. D. Morgan, of Nashville, thus speaks of his great State: "We have in Tennessee, and adjacent States, most wonderful deposits of not only iron and coal in almost illimitable quantities, but embracing also many other valuable minerals, such as copper, zinc, lead and manganese, with plumbago, marbles of every known variety, and other less valuable minerals, which we hope soon to see put into use."

The manager of Boone furnace, Carter county, Ky., N. A. L. Marchant says: "This furnace has not been in operation for two years, but will be put in blast about the first of July next. Nathaniel Sands owns the furnace property, and Finlayson, Childs & Co. will run the furnace. They are now repairing the stack, and will build it ten feet higher, making it 43 feet high and ten feet across the bosh. The ore is very good, principally limestone ore, red and gray. Attached to the furnace are 22,000 acres of finely timbered land. The firm is building a railroad to the Ohio River."

S. M. Krauser, superintendent of Black River Iron and Mining Co's furnaces at Port Leyden, N. Y., thus speaks of the operations of his works: "We have just blown in one of the stacks here on charcoal, after a thorough repair and remodeling. On the 26th of March, at 4 p. m., we put on the blast; on the 27th made the first cast at 4 p. m.; and by the 6th of April, 2 p. m., we had made 96½ gross tons of as nice pig iron as ever I saw. The amount of stock it has taken for a gross ton of metal is 4141 pounds of ore, 414 pounds of limestone, and 105 bushels of charcoal. The furnace is in prime order at present, and makes daily eleven tons. Can Pennsylvania beat this? New York can not. The stack is 57 feet high with 9 foot bosh."

O. W. Davis, Jr., of Katahdin Iron Works, Maine, communicates this information, under date of March 24th: "I am out of blast at present, putting in a new hearth, lining and hot blast. Hope to be in blast again in May, and to be able to give you a good report then." Mr. Davis has moved his office from Portland to Bangor. The tensile strength of his No. 4 pig iron is remarkable—30,765 pounds to the square inch

E. T. Allen, Esq., of St. Louis, says: "The Pilot Knob Iron Company is now dismantling and taking down the furnace of the old Carondelet Iron Works at this place. The furnace and furnace property of the Osage Iron Works Company have recently been sold to J. A. Quenly, of Hannibal, Mo., by order of bankrupt court."

From Edward Shelley, of Wytheville, Va., we learn some facts concerning Wythe county: "Wythe county is making rapid strides in developing the iron interest, and I doubt not will before long become of considerable importance as a producer of car wheel iron. Adjoining counties also are beginning to wake up to the importance of this industry; but it is hard to awaken a purely agricultural section to an interest so diverse. At present we are employing nearly all county capital on a small scale of furnace, but if large capitalists were fully apprised of the large resources of ore, limestone and timber to be found here, I think they would soon invest here. Beside our iron ores, we have lead and zinc ores of great richness and easily accessible; some are being worked with good profit."

In a letter from J. King McLanahan it is stated that Essington Hammond, of Sarah Furnace, Blair county, Pa., has made an assignment for the benefit of his creditors to Mr. McLanahan and Joseph Gardner. He says further: "I am now running the furnace to work up the stock; the furnace did very poorly last year, having been blown out, repaired and altered several times. I expect to make 40 tons a week of cold blast charcoal iron this year. There is a good stock of coal and ore on the bank."

A Chinese Frigate.

The Shanghai *Budget*, says: After some twenty-two months of preparation, at first intermitted by various exigencies and casulties, but latterly pushed forward with great energy and activity, this second war vessel of large size built on the premises and by the employes of the Kiangnan Arsenal, was at length got into such a state of forwardness that the mandarin in charge felt justified in notifying his official superiors she would be launched on the lucky day, the Chinese festival of *Tung-tszoo*—which the more progressive Chinese have translated into the "Chinese Christmas"—and which this year fell on the 22d December. He and his European superintendents and Chinese workmen have encountered and overcome many difficulties in making good this promise, and at seven o'clock the preceding night the hull of the vessel was complete, except some of her deck planking, and her "ways" were in proper trim for the launch. The arrangements for the launch were put under the control of Mr. John Rolls, and the work has been carried on under his inspection by the Chinese foreman and workmen. The construction of the "ways" alone was a work involving no small amount of skill, labor and anxiety, made, as they were, to bear the strain of 1800 tons, the calculated weight of the ship. The new vessel is similar to the one launched from the same building yard on the 24th May, 1872, known as No. 5, the present one, No. 6, being in fact laid down from the same model by Mr. A. G. Lambert before the other was launched. She is built principally of Manilla hard wood and teak; and is copper-fastened throughout, no expense having been spared to make her in all respects a first-class war vessel. Her fittings will resemble ships of her class in the British navy. The principal dimensions of the hull and machinery are as follows: Length, between main perpendiculars, 243 ft. 6 in.; length from face of stern-post to taffrail, 269 ft. 3 in.; beam extreme, 44 ft. 10 in.; depth, 29 ft. 6 in.; displacement when fully equipped ready for sea, 2700 tons. The hull of the vessel has been completed by Chinese workmen in this department. The late Mr. Mainland, shipwright, was engaged for about ten months on her construction, but since his death, in February last, no European shipwrights have been employed; and the stern of the ship, which was not begun when Mr. Mainland died, is entirely of their own construction. The machinery has been entirely constructed at the workshops of the arsenal under the superintendence of Mr. John Rolls; Mr. MacBean, draughtsman, and Mr. John Ure, molder, furnishing the assistance needed from their respective departments with business like efficiency. With the above exceptions, the whole work has been done by Chinese workmen and foremen, and the result, at once solid and shapely, furnishes a conclusive proof and illustration of the progress made by the Chinese in the different departments of mechanics during the past few years. The engines are of the return connecting rod type, of the following dimensions: Cylinders, two in number, 64 in. diameter; length of stroke, 3 ft.; calculated indicated horse-power, 1800; revolutions per minute, 64; diameter of screw, 16 ft.; pitch of screw, variable from 20 ft. to 24 ft. Description of screw (Griffiths' Lifting) the same as fitted and used in H. B. M.'s service. The coal bunkers contain sufficient for seven and a-half days, of twenty-four hours, full power steaming; calculated speed on the ship's full power, twelve nautical miles per hour. The boilers, four in number, are of the "low type" used in the British navy, with sixteen furnaces. The broadside battery will consist of twenty-six 42 pounder Krupp's breech-loading rifle guns and two 90-pounder pivot guns, also by Krupp, on the upper deck.

The ship will be docked after the launch, coppered and completed; will be ship-rigged and spread 22,500 square feet of sails. She is launched, of course, without any of her machinery inside; this will be placed in her under the sheers in front of the dock. By slightly enlarging the lines of the lower part of her stern quarters she is rendered considerably more buoyant than her companion No. 5. This modification was suggested and carried out by Mr. Mainland.

The Chinese may congratulate themselves on another successful launch, it being their sixth, and the best of all.

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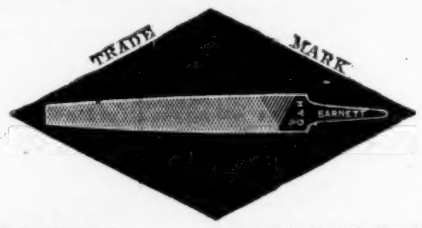

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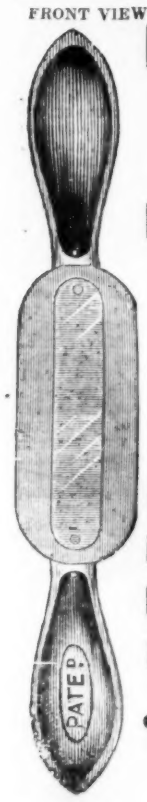

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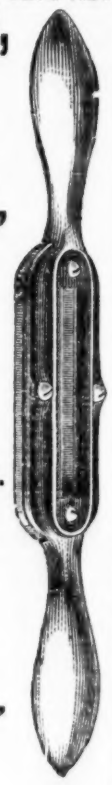

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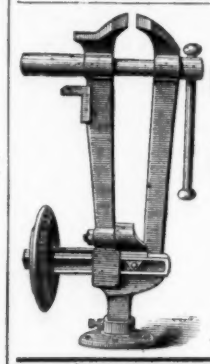

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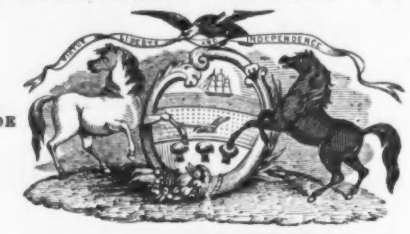
TRADE  MARK

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BUSINESS ITEMS.

PENNSYLVANIA.

Three new members have been added to the Wheeler Iron Company, of West Middlesex, Mercer county, owners of the Fannie Furnace, viz.: T. Dwight Eells and John N. Glidden, of Cleveland, O., and Alfred G. Strawbridge, of Sharon. The Fannie Furnace was blown in on the 9th of October, 1873, having just been completed, with all the modern improvements. Since that time the furnace has been turning out a superior quality of iron, both for mill and foundry purposes. The new additions to the company are largely interested in the iron ore business. The name of the company remains the same, and Mr. Hiram Veach continues as business manager.

The Tipton Iron Company will soon put their new furnace into blast.

The Blair Iron and Coal Company, of Hollidaysburg, will be known as the Cambria Iron Company after May 1st.

The new works of the Valentine Iron Company, at Williamsport, are progressing toward completion. They include a rolling mill, charcoal furnace, etc.

Schmertz & Co., at their window glass works at Bellevernon, are making sixty melts of glass every week, and shipping from 150 to 300 boxes per day.

Furnace No. 2, at Hollidaysburg, has suspended operations for an indefinite period.

The Schuylkill Iron Company, at Pottsville, are going to build a furnace at Hackettstown, N. J.

Everson, Graff & Macrum's rolling mill, at Scottdale, in Westmoreland county, is running double turn and to its full capacity

Charlotte Furnace, situated at Scottdale, Westmoreland county, is in successful operation, making from 40 to 45 tons No. 1 mill iron per day. This furnace has been built only about a year.

OHIO.

The Gaylord Rolling Mill Company, Cincinnati, have resumed work in their bar, plate and guide mills, with a full force of competent workmen.

In a single week, in the month of March, the Blymyer Manufacturing Company, of Cincinnati, shipped three of their large sugar mills to three different foreign countries. Their foreign trade has been large for several years, and is rapidly increasing.

The contract for the fire proof metallic lath for the State, war and navy departments at Washington has been awarded to the John Cooper Engine Manufacturing Company, of Mt. Vernon, including also the new custom-house building at Boston.

The certificate of incorporation of the Lake Shore Foundry, Cleveland, capital stock $200,000, was filed at Columbus on Thursday last. Corporators, Augustus M. Burk, Harvey Taylor, H. F. Taylor, and E. J. Estep.

The Eagle Furnace, Mahoning county, has stopped for repairs, and will remain idle for a couple of weeks.

Brown, Bonnell & Co.'s Nail Factory, Youngstown, which was idle for a week, resumed operations on the 15th.

INDIANA.

The Indiana Car Company, of Cambridge City, have been in full operation since the 15th of February, on 500 cars for the Baltimore and Ohio, Maricetta and Cincinnati and Red Line Companies, employing over 300 men. Their works have a capacity of six box cars per day, and have been turning out their full complement since organization, two years ago.

VIRGINIA.

A Staunton letter to the Richmond *Dispatch* says: "We have been informed that the purchase of the Buffalo Gap Furnace, by a company of English capitalists, under the lead of Professor Ansead, has been completed, and that the company will at once proceed to enlarge and add to the machinery now on the premises, and also prepare for the manufacture of steel rails, either by the Bessemer or Siemens process. They propose to expend four hundred thousand dollars, beside the purchase money, in improved and additional machinery, and will use coal brought from mines already owned by this company, near the Hawk's Nest, in West Virginia."

The Quinnemont Furnace, on the eastern edge of the Kanawha belt, will go into blast next May. The company are already getting out coal from the same property on which their iron works are situated.

ALABAMA.

The furnaces of the Eureka Company, near Birmingham, are turning out sixteen and a half tons of superior iron a day, with a fair prospect of increasing the product to twenty tons per day.

KENTUCKY.

The Louisville *Courier* says: "The first installment of nails from the Norton Iron Works, at Ashland, has been received by some of our merchants. In its products, consisting of pig metal, bar iron and nails, the establishment will compare favorably with any in the United States. Nails of the finest quality are now produced near our market, made exclusively from the coal and ore of Kentucky.

MICHIGAN.

The Spurr Mountain mine is rolling up an immence stack pile, having mined not less than 20,000 tons during the winter. This mine has an able management in the persons of Dr. Cobb, superintendent, and Mining Captain Morrison.

The Lake Superior Iron Mining Company is working a force of 470 men. They mined 12,000 tons of ore in March, and expect to mine as much more this month. They have made no new contracts for ore.

The Cleveland Iron Mining Company are working 416 men, a force nearly as large as they have worked any winter previous to last. They mine on an average about 375 tons per day. They have made no contracts for their ore thus far.

The force at the Kloman mine has been increased to two hundred men, and it is the intention to push work vigorously during the summer. There is now from twelve to fifteen thousand tons in the stock piles, all of which have been mined since the close of navigation last fall. The bulk of the Kloman product will go to the Lucy Furnace, at Pittsburgh.

Slag Sand.

There is now in operation at Robbin's Blast Furnace, Philadelphia, a slag granulating machine which merits notice. The slag flows down its sand channel twenty feet, and then falls about two feet into a basin of water three feet deep. A cast iron semi-cylindrical trough rises, at an angle of about 15° from the basin, in the water of which it is immersed for about half its length. In journal boxes at the ends of the trough revolves a shaft, with blades so attached as to act on the principle of the Archimedean screw, and by their revolution in the trough to lift the broken mass into a shute, whence it falls into small cars. At the same time the water is violently agitated, and emits clouds of steam. This is drawn up a chimney thirty feet in hight, and suggests the practicability of utilizing the heat evolved by the chilling of the slag, in elevating the temperature of feed water or air.

The screw is run by geared shafting, and the machine ordinarily requires but little attention, except to start and stop it, unless the character of the slag should change from black to gray. The latter variety becoming honeycombed as it solidifies, does not break into fragments so small as those of the former.

Every process for disintegrating slag has had for its avowed object the preparation of a substitute for sand in the making of mortar and other lime cements. Now, an important function of sand as a constituent of these mixtures depends upon the shape and size of the grains. They must be neither too large nor too small, and, above all, they must be sharp, their salient angles exposing a proportionally large surface of adhesion to the lime, the adjacent grains touching each other in the mass, and felting, as it were, the whole together. The function is a purely physical one, and the granulating machine at Robbins' Furnace well prepares material to fulfill it. But sand in mortar has also a chemical function, and the question how far this can be fulfilled by granulated slag is a very different and a very difficult one. This function is to form on all the surfaces of the sand in contact with the lime a silicate of that base. Chemical forces here act with that extreme slowness which seems ever essential, if the resulting compound is to possess great tenacity and hardness, and years, perhaps, centuries, elapse before the combination is complete. And yet, if our structures are to attain their maximum stability, such combination is indispensable. Practical men affirm that it takes place most perfectly when the sand is composed wholly of pure silica. Chemists might here take issue with them, but the discussion of the reasons for doing so would exceed the limits of this article, *Polytechnic Bulletin.*

Preservation of Metallic Surfaces.

The great tendency of sheet iron to decay by oxidation has led to the employment of many methods of preventing it. The first and most natural seems to be a coating of some substance, and paint or oleaginous varnish has been much used. This is often employed where the exposure of the natural color of the iron is of no account, or where there is no desire to conceal the material of which the work to be preserved is made.

Asphaltum and black varnish are largely employed in many places, and a surface thus protected is susceptible of being gilded and elaborately finished, after the manner of tea trays, waiters, coffee cans, &c. Coating the sheet metal by immersion in a bath of melted tin is adopted, and is the most common, and perhaps the best, protection sheet iron can have. A familiar illustration is the numerous articles of household use that are so very common.

There is a process called galvanizing (but the term is not properly applied, as the process is not completed by the galvanic current), and this is very extensively used now. It consists in coating the iron by immersion in melted zinc, as in coating with tin. Articles of cast or malleable iron that are exposed to damp, or are for use under water, are coated in this way with advantage. Specimens of this method may be seen in the iron fixtures of washing machines, churns, wringing machines, &c.

There is also a process of enameling, in which the article is dipped into a gummy fluid, and the gloss or enamel, reduced by pulverization or grinding to a powder, is dusted on the gummy surface, where it adheres. The article is then put into a muffle and placed in a furnace, where, after a short exposure to a certain heat, fusion takes place, and a uniform coating is obtained, which is a good protection to such articles as breadpans, saucepans, &c. Enameled kettles and saucepans used by the housewife for boiling or cooking acid fruits are made in this way; and the application of such a coating should be more generally adopted.

To coat the sheets of iron with either tin, zinc, or enamel, it is first immersed in sulphuric or muriatic acid for a sufficient time to clean them of grease or oxide; after that they are washed clean, and again dipped into a solution of muriate of zinc, and finally placed in a bath of tin or zinc, a thin coating of which immediately adheres to the surface.

By means of the electro-deposit process sheet metal may be coated with gold, silver or copper; but this process is used most for articles of ornament, and is intended to hide the metal of which they are formed. As the process is quite cheap, when but a light coating of the metal is required, it is extensively used, sheet brass or soft metal being chiefly selected for this purpose.

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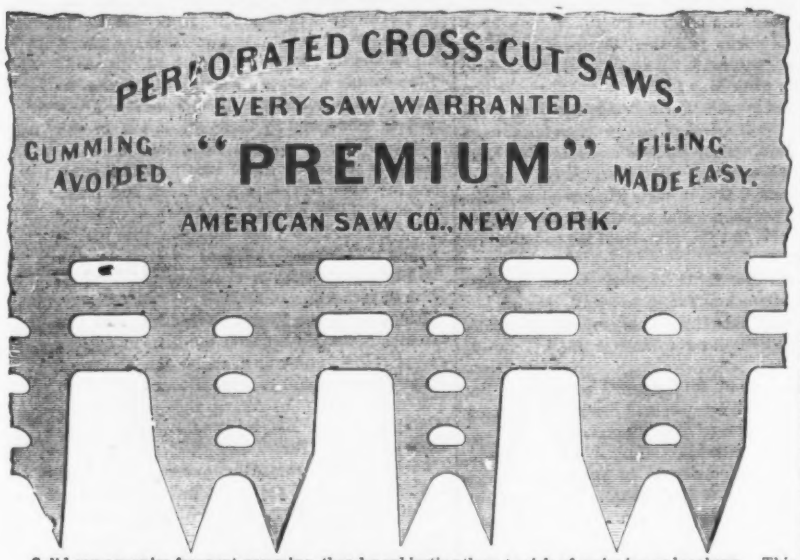

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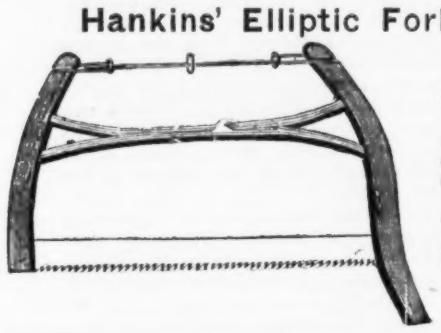

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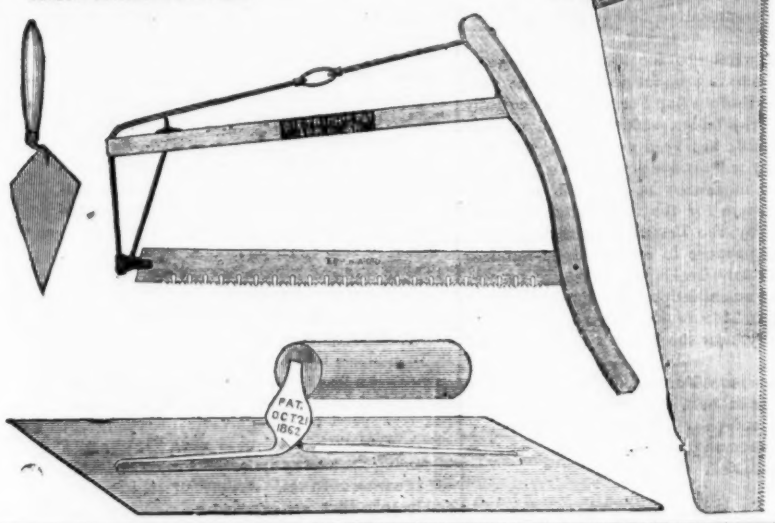

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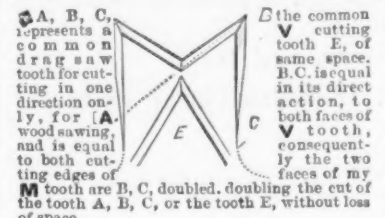
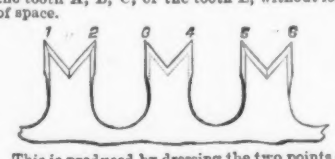


A, B, C, represents a common drag saw tooth for cutting in one direction only, for wood sawing, and is equal to both cutting edges of M tooth are B, C, doubled. D the common V cutting tooth E, of same space. B.C. is equal in its direct action, to both faces of V tooth, consequently the two faces of my doubling the cut of the tooth A, B, C, or the tooth E, without loss of space.



This is produced by dressing the two points of my M tooth, to cut in line so that the outside B, C, has four times the space of the slant edge behind it, or from 1 to 5, while slant has space from 1 to 2, the inefficient slant edges are thus practically concealed and do but slight surface cutting, while B, C, edges cut and clear simultaneously.

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Remedies for the Surface Deterioration of Iron.

BY W. MATTIEU WILLIAMS.

The most obvious device for defending iron against surface corrosion is the coating it with some kind of adherent film, which is more or less capable of resisting atmospheric action. There are two distinct classes of such coverings—first, those which are dissolved in some liquid, are applied cold, and slowly solidify by evaporation or chemical change; and, second, those which are fused, are applied hot, and solidify on cooling.

Of the first class the most common are paints and varnishes. These are so numerous that a separate examination of each would form a treatise in itself. I must, therefore, refer only in general terms to the properties of the most important. A paint consists of two chief components, the liquid medium and the solid body, the body being intimately mixed, but not dissolved in the medium. Thus, in ordinary white paint, the body is carbonate of lead or "white lead," and the medium is linseed oil alone, or more commonly a mixture of linseed oil and turpentine. Turpentine is a volatile oil, *i. e.*, one of those oils which, when pure, evaporate away so entirely that if a piece of paper is wetted by them, and then exposed to the air, no film or stain is left behind. Therefore, if the body were mixed in pure turpentine, the paint would be worthless, as on drying the body would be left behind as a mere dry powder that could be readily brushed away. The use of the turpentine is merely to dilute the linseed oil, which is the true binding medium, and to hasten the drying, the paint being thinned or weakened in proportion to the quantity of turpentine that is used. It is important that this should be clearly understood by all who use ordinary paint for the protection of iron.

Linseed oil is quite different. It is a fixed oil, *i, e.*, it does not pass away by evaporation at ordinary temperatures; it cannot be boiled away nor distilled by heating it under ordinary atmospheric pressure, because its boiling point under such pressure is higher than its dissociation point, or the temperature at which it is decomposed by heat. But it does dry, somehow; in this drying property it differs from ordinary fixed oils, such as olive oil, &c., and thus belongs to another subdivision of the fixed oils, viz., the "drying oils." How, then, does it dry, if not by the ordinary process of evaporation, such as effects the drying of water, spirits, volatile oils, and most other liquids? This question is answered by the fact that it contains about eighty per cent. of a very curious liquid, to which the name of *linoleine* has been given. This linoleine, when exposed to the air, slowly combines with oxygen, and is thereby converted into a solid substance of translucent resinous appearance, and possessing much of the toughness and elasticity of India rubber or guttapercha, though long exposure to light and a moderate degree of heat, such as that of the direct sun's rays, renders it harder and rather brittle. It is adhesive, remarkably impervious to water, and very difficult of solution, either in essential oils, spirits, naphtha, or even bisulphide of carbon. Another important and valuable property of this linoleine is that it expands in drying. This expansion is a simple result of its combination with oxygen, which increases both its weight and bulk. The difference between a varnish and a paint may now be understood as it should be, for the distinction is not merely theoretical, but has some important practical bearings.

In varnishes the solid or body is dissolved in the medium, and the drying (with one or two exceptions, where a drying oil is the solvent) is effected by the evaporation of this medium. Gums, resins, or those intermediate vegetable products called "gum resins," usually constitute the soluble solid of varnishes, and the medium is a volatile oil, spirit, or similar liquid. The solution forms an unctuous adhesive liquid which, when spread out, becomes, on drying, a solid resinous film.

It will be seen from this that there is a remarkable difference between the drying of a paint having the linoleine of drying oil for its medium, and the drying of a varnish, the medium of which is volatile, and dries by evaporation. In the latter there is a loss and shrinkage in drying; in the case of the linoleine there is a gain (of oxygen) and an expansion. The importance of this, where the object is the protection of iron from corrosion, is very great, for the shrinkage of the resinous film of the varnish is liable to destroy its continuity, and form minute cracks through which atmospheric agents may reach the iron. This tendency to cracking is increased by the expansion and contraction to which metals are subject from variations of temperature. The thicker the layer of varnish the greater is the liability to cracking and peeling.

The reader, who is well versed in metal work, will probably object to this by quoting the common and successful use of a true varnish, viz., solution of gumlac or shellac in alcohol, for the lacquering or preservation of brass. But this same lacquer affords so little aid in the preservation of iron, that, although it may be easily applied, it is very rarely used for the purpose of preserving iron or steel. This, I suspect, arises from the peculiar insinuating character of the oxidation of iron, due, as already explained, to the fact that the iron rust itself acts as an oxygen carrier. Every crack, pore or other flaw in the varnish, however small and invisible to the naked eye, becomes a center of corrosion, from which the oxidation spreads downward and radially, undermining all around. This undermining of the film is the more effective from the fact that the rust occupies a much greater bulk than the iron itself, and thus in swelling it must uplift and peel off the brittle film of shellac or other varnish, by a sort of microscopic eruption.

This inward spreading and undermining action of iron rust is the main source of the difficulty of protecting it by paints or varnishes. Even the continuous linoleine film, in spite of its compactness and the increased substantiability afforded by the body of the paint, gradually looses its toughness, curls up and peels off, revealing below a stratum of oxide which has somehow formed in spite of it. It is quite possible that the fully oxidized linoleine may give up some of its oxygen to the iron surface which it covers. This idea is, however, purely speculative, as the subject does not appear to have been directly investigated.

The mechanical adhesion of the protecting film is, of course, a matter of primary importance. Certain substances are said to be "sticky," and this adhesiveness is very commonly regarded as an absolute quality. This is a great mistake. The adhesive affinities of any and every substance, whether solid, liquid or gaseous, vary according to the second body with which it comes in contact. If we take a common pair of scales, balance them, and then allow one of the pans to touch the surface of the water in a saucer, we shall find that it adheres to the surface of the water with considerable force. This force may be accurately measured by gradually adding weights to the other pan until the adhesion gives way, and the beam is tipped in the direction of the weighted pan. By varying the experiments and using flat discs instead of the pan, we may learn whether water adheres with equal or varying force to different solids.

The discs may be of, say, iron, steel, copper, tin, zinc, silver, brass, glass, &c.; if all are of the same shape and of equal size, and balanced before touching the water, the weight required respectively for effecting their detachment measures their respective forces of adhesion. These will be found to be curiously different. If we now acidulate the water, then make it alkaline, afterward substitute it by alcohol, oils, ether, mercury &c., we shall, with each substitution, obtain a new set of relative adhesive powers for each of our solid discs. The most remarkable differences will be found in comparing the adhesion of mercury to iron with that to such metals as lead, tin, copper, &c.

Similar variations occur in the power of adhesion of the different films of which paints and varnishes may be composed, and it must be understood that in painting or varnishing a metallic surface it is the adhesive force, pure and simple, that we have to depend upon. In painting wood or other porous material the adhesion is aided by the fact that the paint penetrates the pores, to a greater or lesser extent, and these extensions inward form minute rootlets by which the film is the more firmly held. If the film swells in drying, as in the case of the linoleine, these roots become firmly wedged, and the paint is almost irremovable.

The practical question before us now assumes a definable shape, it becomes: What available film has the most complete continuity or least porosity, and the strongest adhesion to iron, and is at the same time insoluble and impenetrable by the vapors and gases of the atmosphere? Here is a large and fruitful field for investigation, and one which has never been systematically tilled. We have only the random results of isolated, conflicting and ill recorded experience to guide us.

If I may venture to express an opinion founded on my own observation, which I do with much diffidence on account of its limited and desultory character, I should say that pitchy or bituminous films are especially effective as regards their adhesion to iron. Thus a solution of asphalt or pitch in petroleum or turpentine leaves a strongly adherent film on drying. It is also very effective as regards its continuity, on account of its manner of drying. Instead of forming a hard and brittle scaly film, like most of the gum resins, the pitch film retains a certain degree of plasticity which effectually prevents any cracking, and permits a yielding with the contraction and expansion of the iron. If the iron is at all rusty it penetrates the spongy surface of oxide and envelops the rust particles very effectively, holding them together and enlisting their services to form a portion of its paint body. Such a solution of pitch or asphalt may be regarded as something between a paint and a varnish, the pitch or asphalt being a resinous substance, and, therefore, by its solution, forming a varnish, but it is not a pure resin, for it contains, and is colored by, minute solid particles of carbon, and these, of course, when diffused through the solution, correspond to the body of a paint.

Against these advantages there is one serious objection to a mere solution of pitch. It is to a certain extent soluble in water, and thus when exposed to rain the bituminous film is gradually washed away. This, however, may be remedied by mixing the solution of bitumen with linseed oil, or with a thin paint made by grinding red or white lead in linseed oil. I have tried this; I find it stands very well, and the experiment may easily be repeated by mixing about two parts of Brunswick black with one of ordinary white, red, or stone colored paint, the body of which is composed of red or white lead, or litharge. Red lead is the best if well ground in. There are many kinds of bitumen that may be used, such as natural mineral asphalt, pine pitch and artificial asphalt. There are two distinct varieties of the latter, differing materially in their properties. The first and most common is that which is left when the dead oil, etc., are distilled from common gas tar; the second, the residue which is left when the spirit, lamp oil, lubricating oil and solid paraffin are incompletely distilled from petroleum, or from the crude oil obtained by the distillation of cannel coal or bituminous shale. It is this which I recommend. It is easily obtained, and may be supplied in abundance from the neighborhood of Bathgate by the Scotch manufacturers of mineral oil. In order to obtain it in suitable condition for this purpose the crude oil must be distilled before treatment with acid, and the final distillation stopped before the coking point is reached. By this means a hard, bright pitch is obtained which contains a considerable body of carbon, and which is soluble in the unrefined or "once run" paraffin spirit, which itself is a mere drug in the market, and may be supplied at a very low price.

When I was engaged in distilling cannel at Leeswood, in Flintshire, I prepared a quantity of such paint, and used it very successfully for the preservation of both iron and wood. For such purposes as painting the hinges of cucumber frames, the hoops of water barrels, etc., I used it mixed with only a little boiled linseed oil, and without any further body than the pitch contains. When this sort of bitumen, which, for distinction sake, I will call paraffin pitch, is obtainable, no further admixture than about one-half or one-third of its bulk of boiled oil to the solution in spirit is required.

About twelve months ago I was consulted respecting the means of cleaning and preserving a collection of very choice specimens of ornamental mediæval iron work intended for presentation to a provincial technological museum. They had been somewhat neglected and were already rusted. The problem to be solved was to remove the rust without damaging the surface, and to prevent further corrosion, without destroying the metallic tone of the surface or obliterating the sharpness of the fine ornamental work. The rust might have been at once removed by oxalic acid, but this and all other acids penetrate iron to a certain depth, and afterward set up a new corrosion, however carefully they may be wiped or washed away. Therefore, the use of any acid would have been ruinous. Painting over the surface, in the ordinary way, would have been downright Vandalism, worse than the church warden's mode of cleaning cathedral stonework by whitewashing it. Ordinary oiling had been tried, but though preferable to either of these was not satisfactory. What, then, was to be done?

I obtained from a friend in Flintshire a sample of "once run" mineral oil—*i. e.*, paraffin oil that had been redistilled from the crude oil, but not yet washed with sulphuric acid. This oil contains sufficient free carbon to stain it with a brown tinge, but the particles of this carbon are so infinitesimally fine, that their solidity is questionable—they may be regarded as carbon in actual or semi-solution.

This was sent to the gentleman—an amateur artist—who had charge of the specimens, with instructions that it should be first brushed smartly over the surface of the iron until all the rust disappeared, then wiped off and a second brushing applied lightly, and the surface left slightly and uniformly wetted with the oil. These instructions were ably carried out, and the result is reported to be very satisfactory. The rust was removed without violence, the rusted parts regained their natural color when wetted with the oil and retained it after the oil dried. As the mineral oil is slowly volatile, this drying took place gradually, and an imperceptible film, due to the semi-dissolved carbon, remained behind, and protected the iron from further oxidation without in any degree damaging the tone of its surface. It will, of course, be understood that so delicate a film as this is only fitted for defending the iron from that degree of corrosion to which such carefully preserved specimens are liable. It has the advantage of being very easily applied, and may be repeated with any degree of frequency without damage, as each fresh brushing removes the previous film, as well as any rust or dirt that have subsequently invaded the surface.—*Iron.*

A New Well Boring Apparatus.—Mr. A. N. Morgan, of Brownville, Nebraska, has invented an improvement in well borers of the class in which a spiral flanged auger is arranged to be operated by a sweep or other suitable device, and to be raised from the well to discharge the earth loosened by, and packed upon, the spiral flange. By suitable construction, by turning a crank, the driving shaft will be raised from the journal of a drum, and by turning another crank, the driving shaft will be carried over the boring shaft with which it is coupled, an arm enabling it to be readily guided into place. The arrangement is also such that, when the cutter encounters a stone, the boring shaft is slightly raised, so that the cutter may pass over it and again enter the ground at its other side, and so on until the cutter passes beneath the said stone and thus removes it. A flat steel plate, twisted into spiral form, and made pointed, serves as a bit to force its way into the soil when the cutter does not enter the soil freely. A hollow cylinder, of such a size as to slide up and down freely upon the boring shaft, and to which is attached a spiral plate, receives the dirt from the cutter and carries it out of the well hole. Devices are provided which prevent the possibility of the carrier being overloaded or clogged, and from being turned by the pressure of the dirt against the spiral.

"We are promised," says the *Times of India*, "a new and brilliant light, better than gas, and much cheaper. For the excellence of the light we can vouch, as Mr. A. Silbiger, the patentee for India, brought one of his portable light makers to our office, and completely threw jets of the ordinary Bombay gas into the shade. The materials employed are petroleum refuse and water. The latter is forced through the former, partly decomposed and burnt as a very clear flame. No fire is used, the motive power being weights proportionate to the number of the burners. When tried recently at the photometer house before Mr. Pedder, the Municipal Commissioner, Colonel Kennedy, Mr. Walton, and divers other scientific and practical men, the success was complete. A very little petroleum refuse goes a long way, and water is cheap, so that coal gas will have no chance against the new light if in practice it be found equal to its present promise. The ordinary gas fittings will serve for the distribution of the new gas throughout a house."

The Iron Age.

New York, Thursday, April 30, 1874.

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CONTENTS.

Does Labor Saving Machinery Benefit Labor?

An article published in a recent issue of this journal, entitled "The Emancipation of Labor," has called out a reply in the *Iron Molders' International Journal*, from which we take the following:

What has labor gained within the past twenty-five years by labor saving machinery? What are the burdens taken off its shoulders and placed upon machinery? It does very well to make fine sounding sentences about the relief of labor by machinery, but give us the specifications. We do not deny that labor saving machinery could and should be made to lighten the load of labor, but we know that through causes too well known to need repetition, labor's load is not lightened, but that the very means that should elevate it, is used to keep it in abject submission, and assist in piling up fortunes for those who have the cunning and the power to control the means. By the aid of machinery, labor can produce fully four times as much as it could a quarter of a century ago.

* * * * * * *

All, all the wealth caused by increased production goes to capital; whilst labor, poor labor, must be content with the knowledge that it is able with machinery to do from double to quadruple the work it could do without it. The power to increase production is not necessarily followed by increased consumption, for the great mass of would-be consumers cannot consume, because the wherewithal to secure the products is gobbled up by insatiate capital; and under the present conditions of labor, machinery, instead of being a blessing, oftentimes proves the contrary, by producing beyond consumption, throwing the laborer out of employment, and depriving him of the means to earn an honest living. This we know is not the glittering side of the picture as depicted by 4th of July orators and spread eagle editors, but it is a truth that none can gainsay, though they would gloss over.

We do not answer the questions asked, or statements made, in the article from which the above is taken, because of any desire to engage in a dispute with the *Iron Molders' Journal*, and we should not do so at all, did we suppose that the sentiments above expressed represent the opinion of intelligent workingmen upon the subject under discussion. Did we think so, we should consider it useless to discuss it, since those to whom our remarks are especially addressed must certainly lack the intelligence to understand what we might further say upon the subject. Believing, however, that there are many intelligent workingmen throughout the country who may be glad to learn wherein lies the error concealed in the specious reasoning of trade union leaders, who strive to impress them with the belief that capital reaps all the benefit of current progress in the mechanic arts, we shall endeavor to point it out. It is just here: the producer, in whatever department of industry he may labor, is also a consumer of the products of countless and widely various industries, all of which contribute more or less to his comfort or enjoyment. This is a fact which is overlooked, or studiously concealed, by those who aspire to lead and instruct the workingmen. If the producer had no wants to supply, no desires to gratify, no appetites to satisfy, it would, perhaps, make no great difference to him whether he toiled with rude and simple implements, producing little and of very inferior quality, or whether he produced largely of the most perfect articles manufactured by the aid of labor saving tools and machinery. He would be nothing better than a machine himself, and whether his wage was large or small, as measured by its purchasing power, would matter him little. As a consumer, however, he derives a benefit as great and immediate from the progress of industries which contribute to his enjoyment, as do the consumers of his productions from the cheapening of their cost by the substitution of machinery for hand labor. As a consumer, he needs clothing, and is benefited as much by the improved weaving machinery, the improved button and thread making machinery, and the improved sewing machines by means of which the fabrics are made into garments, as are the thousands to whom the invention of these machines has opened new and profitable occupations, suited to their strength and capacity. As a consumer, he needs furniture, bedding, household utensils, cooking and heating appliances, fuel, light, food—in short, all the necessities of life, and as many of its luxuries as he can afford for himself and family. He is thus a consumer of the products of numberless industries, in each of which some progress has been made toward abundant and cheap production, and in the benefits of this progress he shares in proportion to the amount of his consumption and the number and variety of the desires he has to gratify. With this fact in mind, the intelligent workingman will soon discover that, in his capacity as a producer, he is not one of a great class isolated from other great classes by a dividing line which separates producers from consumers. No such dividing line exists, and if it did, he would be in the anomalous position of being upon both sides of it at once. As a consumer, it is clearly and obviously to his interest that the production of every article he consumes should be increased and cheapened by the introduction of the most perfect machinery which human ingenuity can devise. So is it to every other consumer, and in the satisfaction of wants and desires with a minimum of trouble or inconvenience, as well as in the greater number and variety of needs and desires, consists the principal difference between civilization and barbarism. To assert that any class of the community is not benefited by whatever tends to promote the common welfare, is to deny the simplest teachings of history.

We believe that the workingmen, as a class, have failed to give to these considerations the weight which properly belongs to them, if they have not overlooked them altogether. We therefore present them in the hope that they will assist those who really wish to learn the elementary truths of political economy—truths upon which there is no dispute among the intelligent students of the science, however much they may differ upon questions of policy—to a better understanding of a subject which has been obscured or misrepresented by those whom the workingmen have chosen or accepted as leaders and teachers. How the producer, as such, is affected by the introduction of labor saving machinery, we shall consider in a subsequent article.

On Wednesday last the Committee of Ways and Means, of the House of Representatives, accorded a hearing to a deputation of representative manufacturers who ask for the repeal of the act of June 6th, 1873, which effected a horizontal reduction of ten per cent. in duties or imports, and the restitution of so much of the previously existing tariff law as was repealed by that enactment. We are informed that they will have a hearing before the Finance Committee of the Senate in a few days. We think it is admitted by all but the advocates of unconditional free trade, that, all things considered, the reduction made last summer was injudicious and ill-timed, even though many who favor a protective tariff may doubt the expediency of restoring the ten per cent. taken off. If, however, increased revenue must be raised, as the President intimates in his last veto message, we think there can be no question as to whether it is better to derive it from increased customs duties or from direct taxation. We do not know, as yet, what line of argument the manufacturers follow in urging their views, but no doubt they will make a strong showing in favor of the change for which they ask.

Trade Competition Through Strikes.

The extremely unsettled condition of labor in nearly all trades throughout the world, furnishes a problem for the student of social science which cannot be neglected. The mania among the working classes for redressing of their grievances by refusing to work, save upon their own terms, is by no means confined to the iron trade, nor within any narrow geographical limits. In Philadelphia, the carpet trade, a branch of manufactures of such magnitude that it includes 250 factories with 4000 looms, producing annually the enormous quantity of 18,000,000 yards, giving employment to 60,000 persons, and requiring an outlay for monthly wages of $360,000, has been very seriously interrupted for a considerable time. The complaint of the hands that they cannot live on the wages formerly paid, is not borne out by their supporting themselves through months of idleness on the savings of the past, and, moreover, continually supporting in idleness those whom they have chosen as their leaders. The extent to which this strike has been carried has given color to a shrewd local suspicion that "relief" is being extended to the idle workmen from other classes than their own; in short, that the strike is becoming a new method of trade competition. The idea is not new or confined to the trade here named. It, however, suggests a simple explanation for very many protracted and disastrous strikes in the iron trade. Unfortunately for the iron manufacturers, the local advantages of fuel, transportation and market for product, are so vastly different in various sections, that no combination for the maintenance of a given scale of wages, prices or contracts can be maintained. All such efforts previously made have been total failures, and where honest endeavor has been made to the end desired, frank admissions have invariably confessed the impracticability of such an arrangement, if any profit is to be earned. Hence, the same "cutting" in prices for finished irons which has been noticeable in manufactured goods, and hence, also, the suspicion that, as all is fair in war, a strike in a competing works is often indirectly aided and supported by employers in the same line. Numerous instances have occurred of strikes which could have been supported in no other way.

When such a method is adopted for promoting the interests of one locality or establishment at the expense of another, it requires no great foresight to discover that the employer or employers adopting it are doing all they can to injure their own interests: and it is some satisfaction to know that it will not be long before we shall see "the engineer hoist with his own petard." Inventions of this character return to plague the inventors, and any temporary advantage which may be gained, will be more than off-set by the subsequent inconvenience and loss resulting from the demoralization of the labor market, and the certainty that their own men will take advantage of the first favorable opportunity to demand advances under the threat of strikes. We doubt if any employer, however selfish, would have recourse to the discreditable expedient of inciting or sustaining strikes in the works of other employers, could he foresee the result of such a policy. We are aware that American employers, especially American ironmasters, do not yet realize the importance of co-operating for their mutual protection against the trade unions, which are now exerting so powerful and unwholesome an influence over the workingmen; but it is certainly a matter of surprise that any should be so blind to their own welfare as to make use of strikes as a means of injuring business rivals. And yet we know of instances very near home, in which the owners of mills stopped on account of strikes have vainly sought for sympathy and co-operation among their neighbors, whose men were only awaiting the issue of the struggle to demand for themselves what the strikers should gain. Whatever is gained by such a course, has to be paid for roundly in the end, and those who cannot see this will not be long in learning it from experience.

Patentable and Unpatentable "Improvements."

To know what is and what is not patentable, and what a patent will or will not cover, is of the greatest importance to inventors, as the possession of such knowledge tends to prevent waste of time and money in futile applications or useless suits for infringement, as well as many bitter disappointments. A decision has recently been rendered by Judge Woodruff in the United States Circuit Court for the Northern District of New York, in the case of Marsh *vs.* The Dodge & Stevenson Manufacturing Company, in which the following principles were laid down:

A claim to a result is not, *per se*, patentable; neither can a claim be sustained which covers every mode or means by which certain advantages can be secured in a harvester.

The mere location of an old apparatus upon a machine is not patentable.

If new devices are required in order to adapt an old apparatus to a new position on a machine, and the change produces a new and beneficial result, then the change is patentable in connection with the new devices; not the result, but the means of producing it.

Or if such a change brings into existence a new combination of devices productive of a new and useful result, the new combination is patentable.

The patent will not be infringed in either case by a like change in the location of the apparatus unless the new devices which adapt it to its new position are also used in one case, and unless all the material elements of the newly developed combination are employed in the other.

In changing the location of an apparatus upon a machine it seems not to be patentable to adopt such mechanical changes to render it practicable as mere judgment dictates or the necessity of the case demands.

The above decision contains two silent, but forcible, admonitions to patentees, which they will find it to their advantage to attentively consider. In the first place, inventors are very apt to make their claims for improvements too broad, and are too prone to litigate for what, if permissable by law, would altogether exclude the modifications or useful adaptations of other inventors upon the same machine. The useful lesson of moderation is one which they may learn from the ruling in the above case. Secondly, they are extremely apt to fall into the error of supposing that the mere shifting of the location of some adjunct of a machine from one part of it to another, by means of a device which is not new (often a very questionable improvement) produces a patentable result, when the fact is that a change of this sort is only patentable when effected by the adaptation of a new and original device, and that the mere result of such a change is never patentable. There are points of law which inventors would do well to remember. It is often possible to obtain patents upon improvements not recognized as patentable by the courts, but such patents are worse than useless, and often involve the holders in costly litigations, in which they engage with confidence and assurance of success, only to find that their patents are good for nothing, and that they are saddled with damages for infringements and costs of suits. We have known many men who have been ruined by patents of this character, obtained for them by unprincipled agents, whose only object was to secure fees for professional services, and whose only care was to have their claims passed by the examiners. The agent who will undertake to obtain a patent upon anything, is usually a man of whom inventors would do well to be shy.

Free Banking.

It is evident that free banking is gaining favor in both houses of Congress, and the probabilities are that Mr. Merriam's bill, or one embodying essentially the same provisions, will be adopted as a compromise. It is proposed to make national banking free under the conditions now imposed by law, and remove all restrictions upon the amount of notes which the banks are permitted to issue: also to provide for the redemption of surplus national bank notes in legal tenders at the New York Sub-Treasury. This seems to us a most excellent plan. It gives us all the currency for which employment can be found, and effects a constant and natural redistribution of national bank notes, by returning them to the banks from which they came when the accumulation here exceeds the needs of the local market. As it adds nothing to that portion of the currency for the redemption of which the government must ultimately make provision, it places no obstacle in the way of a return to specie payments,—to which so many look forward to with exaggerated anticipations, but to which there will be no objection when it shall be possible to resume without disaster to the business of the country. Under such a system, all the evils which are predicted as the result of free national banking would promptly cure themselves, and it is quite certain that capital would not seek employment in the business without the assurance of reasonable profit, at least. It is not necessary to repeat, in this place, the arguments in favor of free banking already presented at length in these columns, but they are numerous and strong enough to make it incumbent upon all friends of domestic industry in Congress to use every effort to secure the passage of a law conferring its benefits upon the country.

Lightning Conductors.

Fortunately for the preservation of property and life, it is no longer an open question whether conducting rods afford buildings an effectual protection against lightning. Experience has shown, beyond any doubt, that they do. The instances in which dwellings, or other edifices, provided with rods, have been struck by lightning, are those in which the persons intrusted with the task of placing them have been ignorant or unskillful, or the appliances themselves insufficiently distributed or imperfect conductors of electricity. As the season for "thunder showers" is approaching, and as most of our readers are more or less interested in the subject, a few suggestions respecting rods, and the proper mode of setting them, may not be out of place in these columns.

Perhaps the best kinds of lightning rods are those made wholly of copper. Next to these are rods of galvanized iron. A wire rope of either of these metals, continuously twisted, forms an admirable conductor. A rod without breaks is, we think, a better protective agent than one which is put up in sections. It is well known that the electric current passes more readily over an unbroken surface than over one in which breaks occur, and it is extremely difficult, if not impossible, to unite the several points of a sectional rod so as to render the conduction as perfect as it would be along one without joints. An electro-gilded tip, with two more points perfectly connected, is a decided advantage to a lightning rod. A moist spot should always be chosen for the insertion of the ground end of the rod, and it should extend downward from 6 to 8 feet. Metal straps, properly adjusted, are all that are necessary to secure the rod against the side of the building, and as close a contact with it as may be is desirable to guard against ascending as well as descending currents. More complete protection is secured by providing each stack of chimneys with a separate conductor, either communicating with the ground or with the main conductor, preferably the former. The gutters and leaders should also communicate with the ground through a metallic medium. When wire rope is used it need not exceed 5-16 or ⅜ of an inch if of copper, or ½ of an inch if of galvanized iron. A vitally important point is frequently overlooked in erecting lightning rods, viz., to connect them with the metallic coverings of a building. This is especially desirable in affixing them to the roofs of churches. As the rule, they are simply attached to the steeple and carried to the earth. This is not enough for complete safety. On the roofs of such edifices are usually isolated masses of metal and iron clamps between the stones. Now, as every metallic substance is, more or less, inductive of electricity, every isolated point where they are present invites, as it were, the passage of the current. The true way to cut off danger from these sources is to unite them all with the main conductor. Thus the entire metallic portion of the structure becomes one, and every mass serves but to increase the efficiency of the main rod or rope.

The same plan might be adopted indoors at a very trifling expense, and form as efficient a protection. When lightning passes down the chimney of a dwelling, it is very apt to leap from one metallic or gilded article to another in the apartment into which it escapes from the chimney. The best way to guard against this is to connect the fire places, iron bedsteads and bells by a single wire soldered to the iron rain water pipe, and polished at the point of junction. Half a pound of No. 16 gauge copper wire would be sufficient for this purpose. The interiors of most town houses could be protected against lightning by means of this very simple and inexpensive device, and a feeling of security be engendered by its adoption, worth the outlay of a good many dollars to persons who are timid and nervous during thunder showers.

Heating by Steam.

The method of heating buildings by means of steam pipes is of comparatively recent introduction, and presents some peculiar features of interest. The ordinary modes of constructing a steam heating apparatus are to place pipes connecting with the boiler along the base-board of the room to

be warmed, or to have the pipes coiled within ornamental fretwork with marble tops, &c., and also to have radiators of other construction placed directly within the appartment. The term "radiator," as applied to a series of pipes filled with steam, is, strictly speaking, a misnomer, as the heat obtained from them comes from the contact of the atmosphere in the room with the pipes, and is conducted, not radiated.

These pipes, or coils of pipes, warm the air already in the room over and over again, and although they do not vitiate the atmosphere by an excessively high temperature, the heated air coming from them may become as injurious to the health as it would be from hot air furnaces or any other source, unless means are taken to secure good ventilation.

Another method is, to locate the entire apparatus in the cellar, or some lower room, and draw in the outdoor air, warm it, and pass it up through flues into the rooms. These flues are usually of tin, and built into the walls. A register is placed in each room, at the top end of the flue, to regulate the inflowing warm air, and a ventilator to draw off the colder air, and make way for the fresh warmed air to enter, is situated near the floor. In the rooms of ordinary dwelling houses, the fire place is usually sufficient for this purpose. Each room has its own separate heating chamber placed directly beneath it. By this plan a very thorough ventilation is secured, as the inflowing warmed air must displace a corresponding quantity of that previously in the room, and thus a constant and thorough change in the atmosphere is constantly going on. The distinctive feature of this plan is to give each room its own separate heater and ventilator, without occupying any space within, or disfiguring the room. Steam, at a very slight pressure, will flow to analmost unlimited extent through pipes from the boiler, and as no climatic influences can reach it, the heat obtained is uniform, however remote from the fire, either in a horizontal or vertical direction, the register may be. In some large buildings, fans driven by a small steam engine are occasionally employed to force the warm air upward when the flues are small, or where extra ventilation is wanted. The same fans can be used to produce cold draughts in summer.

The boilers for this particular method of heating by steam are constructed of jointless coils of heavy lap-welded tubes, placed in the fire chamber at such a distance that the fire must burn rapidly to reach them, as is the case with the generating surface of common boilers. These coils are connected with one or more small cylinders placed over the fire, which cylinders serve the double purpose of water and steam reservoirs, and the water is constantly and rapidly circulated in the coils down through the fire and generated into steam.

The concurrent testimony of several of the largest manufacturers of steam heating apparatus in this city goes to show that, by any ordinary construction of these appliances, superheated steam cannot be produced, so that all the supposed danger arising from this source has no existence in fact. The fire risk of steam has been the subject of a great deal of scientific and unscientific discussion, but without reviewing the conflicting testimony, we can confidently assert that there is no objection to steam heating on this score which does not equally apply to other systems. If furnace flues are in contact with wood-work, there is always danger of fire, and the same is probably true of steam pipes. A due regard for safety requires that woodwork should not be allowed to come against either pipes or flues, or to be within six inches of either, unless protected by a non-conducting and non-combustible shield.

Gas Purification.

The consumer and maker of gas are alike interested in securing the cheapest and most effective agency for removing its impurities and rendering its consumption more economical. Gas, when it leaves the retort, is usually so heavily charged with aqueous vapor, that the reduction of temperature which it undergoes in the "main" changes it to water holding in solution sulphur and ammonia, which are deposited and form corrosive salts upon the interior of the surface pipe and greatly lessen the product at the mouth of the jet. The exceedingly attenuated state of the aqueous vapor accompanying the gas when evolved certainly favors the removal of these impurities. Unfortunately, however, gases and vapors being much less soluble in warm than in cold water, the result is, that by the time the gas is lowered in temperature to the degree necessary for the solution of any impurities that exist, the watery vapors have been precipitated without dissolving their accompanying impurities.

Mr. B. E. Chollar, an enterprising young engineer, of St. Louis, has lately suggested a method by which this objectionable feature of gas generation may be obviated. His proposed plan bears a very close affinity to the natural process of condensation, with this important difference—that the water in his method is injected by means of a small jet of the gas itself compressed by a small pump for that purpose. The water is thus so completely dispersed as to become a vapor, while the temperature is sufficiently lowered to rapidly and thoroughly dissipate any soluble impurities, an expenditure of the minimum amount of water and least amount of extra hydraulic pressure being insured. The economy and simplicity of such a process commend it to the consideration of gas makers and consumers.

New Publications.

GEOLOGICAL SURVEY OF NEW JERSEY. ANNUAL REPORT OF THE STATE GEOLOGIST FOR THE YEAR 1873. By George H. Cook. Murphy & Bechtel, Trenton, New Jersey.

The geological survey of New Jersey was originally authorized by an act of the New Jersey Legislature passed in 1864, and supplemented by two others passed in 1869 and 1873, respectively. This important survey has been conducted by Mr. Cook, state geologist, assisted by Prof. John C. Smock, assistant geologist, Mr. Edwin H. Bogardus, chemist; Prof. Edward A. Bowen, engineer and surveyor, and Messrs. Wm. A. Chapman, Elbridge Van Syckel, Jr. and James K. Barton, graduates in engineering of Rutgers College, and has been actively prosecuted among the Highland, Jenny Jump and Marble Mountain Ranges, on the boundary between New York and New Jersey, and among the Great Meadows, of Warren county. The report is clearly and concisely written, the information contained in it is extremely instructive, and the aggregation of scientific facts in relation to a portion of the State so rich in mineral resources cannot fail to prove exceedingly interesting to its citizens, and give additional impetus to its mining industries.

Business Failures.

The following is the record of failures in the United States during the last four years, as kept by the Mercantile Agency of Dun, Barlow & Co., of this city:

	1873. No.	1873. Amount	1872. No.	1872. Amount
States.	Failures.	Liabilities.	Failures.	Liabilities.
Alabama	52	$1,337,000	75	$1,501,000
Arkansas	17	307,000	20	217,000
California	70	1,500,000	80	2,434,000
Connecticut	104	1,452,000	70	2,370,000
Delaware	31	663,000	20	189,000
District of Columbia	13	240,000	8	59,000
Florida	10	258,000	15	179,000
Georgia	67	2,113,000	73	1,293,000
Illinois	329	7,109,000	185	11,470,000
Indiana	134	2,260,000	80	991,000
Iowa	141	1,915,000	91	876,000
Kansas	94	821,000	90	860,000
Kentucky	125	2,287,000	99	2,059,000
Louisiana	74	2 831,000	85	3,100,000
Maine	80	752,000	90	1,072,000
Maryland	63	1,2 9,000	75	5,045,000
Massachusetts	309	11,224,000	253	25,374,000
Michigan	248	3,917,000	175	2,780,000
Minnesota	61	914,000	43	407,000
Mississippi	79	909,000	54	591,000
Missouri	188	5,817,000	175	2,670,000
Nebraska	22	311,000	17	201,000
New Hampshire	27	513,000	37	447,000
New Jersey	119	2,482,000	126	2,036,000
New York	544	13,721,000	423	8,447,000
New York City	644	92,635,000	385	20,684,000
North Carolina	63	672,000	30	282,000
Ohio	321	11,320,000	226	6,569,000
Pennsylvania	576	31,445,000	445	9,422,000
Rhode Island	58	15,259,000	40	1,179 000
South Carolina	36	1,927,000	40	801,000
Tennessee	77	1,636,000	56	1,438,000
Territories	44	808,000	15	252,000
Texas	116	1,754,000	75	860,000
Vermont	21	350,000	30	229,000
Virginia, East and West	125	2,188,000	103	1,635,000
Wisconsin	81	1,574,000	66	1,127,000
Total failures	5,185	....	4,069	....
Total liabilities	..	$228,499,000	..	$121,056.000

	1871.	1870.
Total failures	2,915	3,551
Total liabilities	$85,252,000	$88,242,000

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, April 27, 1874.

The veto has, of course, formed the prominent topic of discussion in all circles for the week past, and the expressions of opinions have been almost as varied as were the views on the matter previous to the action of the President. What the political effect of this action may be is a matter of very little importance to the business community. If this veto should result in giving us a system of free banking, based on such principles as will command the confidence of capital and the business interests of the country; one which shall destroy the monopoly of currency in any one section of the country, the object desired will have been accomplished. Those who expected to see their government bonds rapidly appreciate when the danger of inflation was removed, have been surprised at their decline, and at the failure of prices of goods to respond in any way to what they considered so important an act as the veto of the so-called inflation bill. The result shows that the unfortunate condition of business interests is not dependent upon the action or inaction of Congress; that the restoration of confidence and activity will be of slow growth, and that time to recuperate the business interests of the country is quite as necessary as theoretical legislation. As likely to improve our credit abroad, and thus induce the further investment of foreign capital here, the veto is undoubtedly a good measure; what may result from it beside hard feelings between the two sections at home, remains to be seen.

A step toward the erection of the Centennial building has been taken in an excursion lately made by the directors of the Exposition, presidents of councils and a number of prominent officials to the works of the Phœnix Iron Company, at Phœnixville. The object of the visit was to inspect the style of building used for the new mill of the Phœnix Iron Company, and as showing how this system could be readily applied to the Centennial buildings, offering as it does the advantages of extremely rapid construction, and leaving the material used in a merchantable state after the purposes for which the building is intended have been served. The new mill covers an area of six acres, the main building being 937 feet long by 280 feet wide, the roof of slate, supported on Phœnix columns, 30 feet high, with a roof elevation of 30 feet more, or 60 feet in the clear center. A building suitable for the Centennial could be erected on this system within one year from the time of commencement, a highly important point in view of the time which has already been lost. The expense would be probably less than in most other firms, the value of materials for subsequent sale being considered, and the entire responsibility of the Phœnix Company, with their facilities for performing the work, render the construction within contract time a certainty. It would greatly relieve the best friends of the Centennial to know that the erection of the buildings had been entrusted to parties like the Phœnix Company, which has almost invariably made a point of finishing work before contract time.

Notwithstanding the general dullness, our manufacturers in some lines are doing a healthy and growing export trade. In the list of vessels loading for the week are three with rolling stock for foreign countries. One of these takes four narrow gauge locomotives and forty cars, packed in sections, to Santos, Brazil. Two of these, the bark "Matthew Baird," and the brig "Etta M. Tucker," will take twelve large size locomotives to Nicholaer, on the Black Sea. The freight on these locomotives is $15,000, gold, and the cargos are part of an order now being filled for the Russian Government by the Baldwin Locomotive Works. The steamers sailing weekly now take an increasing quantity of varied iron manufactures, including wood working and agricultural machinery, car wheels and tools. Before our Centennial arrives we shall have an export trade which will be greatly strengthened by the visitors to that exhibition, and add much to our manufacturing importance.

To provide for the growing shipments from this port, the Pennsylvania Railroad Company has commenced the erection of a new freight depot on the Delaware River front. This building will be 472 feet long on Delaware Avenue, and 116 feet wide, built of brick, with an iron truss roof, and will be finished by August next. Track communication with the Washington Avenue branch of the main line will be had along the river front, and all freights moved by steam. Additional track connection along the river will be furnished with the Reading Railroad at Willow street, and the whole city front be thus provided with steam roads, bringing freight directly to the shipping. In view of the rapid increase of grain shipments from this port this is important.

The inclined plane railroads at Birmingham, Pittsburgh, are to be rivalled here by a new road, now under contract, to lead from Manayunk to Roxborough, two suburbs in the northwestern portion of the city, the latter of which is at as great an elevation above the former as the village of Mount Washington is above Birmingham. These perpendicular railroads are not encouraging viaducts to travel in, but save an immense deal of climbing, and, where tried, have been perfectly safe.

Labor continues demoralized. A number of molders of the Baldwin Locomotive Works Foundry are on strike, not for wages, but against the employment of gang bosses. The strikers form a small portion of the molders, the cylinder and wheel molders being at work, and the applications for vacancies numerous. The firm has been turning out but four locomotives a week for some time, but a considerable improvement in orders is reported, and in a short time the works will be run to their full capacity. The striking saw makers discharged from Disston's Saw Works are out in an advertisement of a co-operative saw company. They have taken a building formerly occupied as a saw works, and solicit subscriptions to the stock of their company. If all union men, of all trades, would start co-operative works and try union rules in them for themselves, a vast deal of good might be done, as their certain failures in business would teach them by experience that there are two sides to the labor question far more forcibly than a prolonged system of strikes.

The numerous manufacturers of iron goods throughout New England will be glad to learn that they are soon to have additional rail communication with the Lehigh coal field of this State. The first report of the Lehigh & Eastern R. R. has been published, and shows the road to be well under way. When completed, it will form a connecting link from the Lehigh Valley to New England, and must be a great coal and iron carrier, especially as the company proposes to carry such freights at 1½ cents per ton per mile. The road *en route* intersects the Lehigh Valley and Lehigh & Susquehanna roads near home, and at Stroudsburg the Lackawanna & Western; at Port Jervis, the New York & Erie, and the Midland and branches next. East of the Hudson it crosses the Hudson & Erie and the Duchess & Columbia Railroads, which cross it at right angles; then the Westchester, Housatonic, Naugatuck, Canal, New Haven, Hartford & Springfield, New London & Willimantic and Cheshire Railroads, with its ultimate terminus at Boston. Thus, it will be seen that this road means cheaper fuel, and the avoidance of heavy winter stocks to the numerous manufactories of the crowded territory through which it runs, and it will also form an important link in the great trunk lines from the Atlantic at Halifax to the Pacific, two days and a half in time being saved in the distance from here to Halifax alone

By another week we will be able to see the effect of the veto upon business, and I shall hope to chronicle, if the views of the resumptionists are correct, a manifest improvement in trade, or, at least, some indication to that end.

Inducements for Iron Investments in Northern New York.

To the Editor of The Iron Age:—It is probably known to most of your readers that there are in Northern New York extensive deposits of ore beside those of Lake Champlain, and that some of it has been used to good advantage as a mixture, but the vast extent and richness of these deposits of specular and hematite oxide ores is not generally known out of New York State, as most of the ores heretofore mined have been used by the furnaces in the State—a small quantity only having been shipped to Ohio and Pennsylvania.

In the counties of Jefferson, Lewis and St. Lawrence are found all the varieties of ore necessary to make a perfect iron, and which work together in the furnace very freely with both anthracite coal and charcoal, averaging in the furnace over 50 per cent. metallic iron.

We find also in Jefferson county, along Lake Ontario, one of the finest fluxes to be had in the State, and some of the furnaces west have found this out and are now using it. At Chaumont, on Chaumont Bay (an indentation of Lake Ontario), is found the purest and best adapted to our ores, and a quarry is now being worked by the Rochester Iron Manufacturing Company, and the limestone used at their furnaces at Charlotte.

Chaumont Bay is a fine harbor; plenty of water; limestone in abundance, and at least three varieties of ore can be delivered there at a price not exceeding three dollars per ton, while coal costs from $5·50 to $6·50 per ton. With these figures as a basis we can estimate the cost of Pig Iron at this point as follows, viz.:

2 tons ore at $3	$6·00
1½ " coal at 6	9·00
Labor and Flux	5·00
	$20·00

It is my opinion that the figures exceed the actual cost, as my labor estimate is higher than necessary for two or more stacks.

The great disadvantage of manufacturing iron in small or inland towns is the distance from and excessive cost of transportation to a market. Chaumont is an exception to this rule, as during the season of navigation iron can be laid down in Cleveland, Chicago, Milwaukee and any port in Canada at an additional cost not exceeding $1·50 per ton.

In regard to Canada as a market, it is now well known in this part of the country, at least, that we can compete with their home manufactured iron, even now that they have fixed a duty of 5 per cent. on pig iron from the United States. Last year they used, of New York State irons, made exclusively from New York State ores, more than double the quantity ever used before. I have no personal interest in property of Chaumont or vicinity, but only a strong desire to see the mining and iron manufacturing interests of this section more largely and fully developed. I write this after a close study of the cost of manufacturing iron in most cities of New York State, and conclude that iron can be manufactured here, close to the ores and, flux at from $5 to $10 per ton cheaper than at almost any other place in New York State.

Yours, very truly,

ORIN C. FROST.

April 25, 1874.

Large Product of Steel Rails at the Troy Bessemer Steel Works.

The Bessemer Steel Works of Messrs. John A. Griswold & Co., at Troy, New York, are making an unusually large average product of steel this season. Between 5:55 a. m. of April 13th and 1:45 p. m. of April 18th 195 heats were made, yielding 971 850-2240 tons of ingots, thus accomplishing this before unattained result in 127 5-6 hours. The work was performed by two sets of hands, and no extra ones were employed. Each day's product was as follows: Monday, 37 heats; Tuesday, 33; Wednesday, 38; Thursday, 36; Friday, 40; Saturday, 11. Total, 195. The following is a record for the week ended April 25th:

3663 steel rails, all first quality, 60 lb. pattern—standard length 30 feet—(3 8-10 per cent. shorter bars); weight, 1012-11-2-19.

Average rolling time, day turn, 8 h. 17 m.
do. do. night do., 8 h. 39 m.
Nine furnaces, 6 heats each on each turn.
Rail train, 21 inches diameter, making 80 revolutions per minute.

Boiler Explosions.

An able writer in *The Engineer*, discussing the subject of the Blackburn boiler explosion, says:

When a boiler explodes, a very considerable portion of the energy previously concentrated in the water is expended, not on the boiler or building, but in converting more water into steam at atmospheric pressure, and it thus happens that although the destruction wrought by the explosion of a large boiler may be fearful, matters are never as bad as they would be but for the remarkable property possessed by water of instantaneously utilizing its stored up energy in the comparatively harmless way of flashing a portion of itself into low pressure steam. And this brings us at once to the puzzle, or puzzles, to which we have referred. We hear of stones being flung long distances, while a flue was lifted high in the air and fell on the roof of the weaving shed. Let us take this flue as typical, and ask ourselves how it was raised. The obvious answer is, "Oh, the steam carried it there." Precisely—but how did the steam carry it there? Taking the flue at 30 ft. long, and just allowing a strip of its surface 3 ft. wide as an effective basis for the action for the steam, we have only 90 ft. surface. A body of steam at 80 lbs. pressure and 1 ft. thick over this surface would weigh about 2 lbs. only. It is impossible to imagine a sufficient velocity imparted to this 2 lbs. of steam to enable it in any way to impinge on the flue and thus propel it through the air. Nor shall we be helped if we say that the pressure beneath the flue was unbalanced the moment the shell burst, and this unbalanced pressure lifted it. The pressure must have operated for a considerable time after the flue started on its flight, otherwise no energy could have been stored in it to enable it to continue its ascent. To what then are we to look as the direct cause of the ruin which attends a boiler explosion? Where is the link between the energy stored in the water and the walls blown down at a distance, the scattered bricks of the seating and the flying boiler plates? We do not think it *too much* to say that these questions have never been answered, and that the effects developed are perhaps after all manifestations of the exertion of force by the aid of very minute quantities of matter, operating in a way which is not quite understood. The cause of a boiler explosion is one thing, the cause of the effects of an explosion is quite another. We hold now, as we have always held, that there is nothing occult about the reason why a steam generator bursts. Neither, perhaps, is there anything mysterious about the flying of plates and the loss of life, and the ruin of buildings; but it is quite certain that no solution yet put forward has proved capable of that accurate numerical demonstration which can alone insure its acceptance. That ruin ensues when a boiler bursts we know, but we do not know whether a flying brick flies because it has been subjected to intense pressure acting through a limited space for a short time, or whether it is carried on a blast of steam as a leaf is carried by the wind, or whether it is driven by energy transferred from a mass of water moving, and whose movement the luckless brick has checked. Nor is it quite certain—although, in deference to accepted opinion, we have spoken as though it were certain—that the first effort of energy set loose in the rent boiler is to convert more water into steam, and not to manifest itself in some other way which is apparently occult, but only so because very little is really known about the manifestations of energy, or the bond which exists between force and matter.

As bearing upon this subject—and because it is written with a certain characteristic Western humor and crispness of style, we give the following extract from a letter lately written to Hon. E. Wells, by a gentleman who believes in the electric theory of boiler explosions:

"If you, Mr. Wells, will sit with me at 10 o'clock at night, and watch an incoming Mississippi River steamer—the evenings are delightful here, even now—you will see a stream of electrical sparks rising from the boiler, exposed to view from the shore on a Mississippi steamboat, to the cabin floor above. Water is not a good conductor, and, therefore, electricity rapidly generated in the production of steam is rapidly accumulated. If, when this steamer nears the shore, you would have a very delightful sensation, Mr. Wells, get into a little boat, holding in your hand the end of a chain attached to the shore, and going out into the river, meet and touch, with the other hand, the bow of the approaching steamer—you will be knocked instantaneously into the nether extremity of kingdom come. I am persuaded, Mr. Wells, that the lightning has to do with explosions; *steam, per se, explodes nothing.* There are gases generated when water is resolved into its original elements by electricity, or by coming in contact with red hot iron surfaces, which may beget violent rending of boiler plates, but simple pressure is exerted by steam and no explosive force. Therefore, Mr. Wells, the necessity for the strongest, most tenacious iron in the construction of boilers.

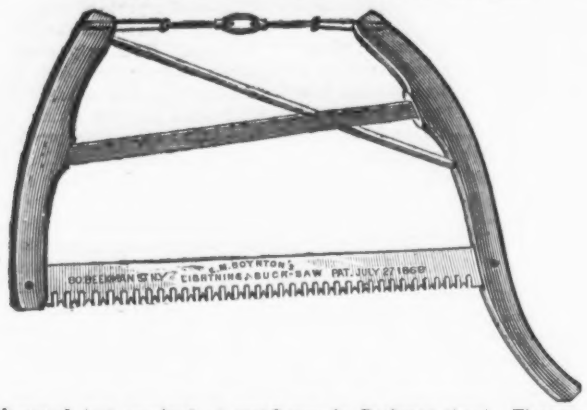
"I was standing on a railway roadside in Illinois in the winter of 1856-7. The weather was fiercely cold—the thermometer below zero. A train came in very slowly with half frozen passengers. Ice, a perfect non-conductor, covered the track, and the wheels of the locomotive spun around on the glazed surface. It was perfectly insulated. An instant before I saw electrical sparks—the night was dark—rising from the surface of the locomotive. When insulation was effected by the ice on the track, and by loosening the link connecting the locomotive with the train, there was an explosion as sudden and frightful as ever added terrors to the sublimity of Hecla or Vesuvius. A piece of iron weighing 200 pounds was driven through a brick wall 100 yards away. Steam did none of this terrible work. When the Louisiana exploded at New Orleans, a boiler head was thrown several hundred yards, falling in Canal street. Steam exerts no such sudden or violent force. Moreover, Mr. Wells, when a boiler is thus destroyed, you will observe that the force is often external, and sheets of iron boilers are bent inwardly as well as outwardly. Nature's effort to produce an equilibrium is observeable, and we are led to think of that positive and negative electricity, of which we hear so much and are taught so very little in the schools. Of all mere learning, President Barnard, of Columbia College, has gathered perhaps more affecting these questions than any American philosopher. I've heard him discuss them with rapt attention through many an hour, and if the facts here recited may be useful, he can tell the Congressional committee what they signify."

Semi-Centennial Exhibition of the Franklin Institute.—The Board of Managers of the Franklin Institute, for the promotion of the machanic arts, announce that an exhibition of manufactures, products and the arts, will be held in Philadelphia, commencing on the third of October next, and cordially invite manufacturers, mechanics, artists, agents, inventors, and others, to contribute specimens of their skill, ingenuity and taste to this grand industrial exposition, and thereby make it a true index of the progress of this society, and the wonderful improvements and discoveries made in the mechanic arts during the past fifty years. In view of the approaching international Exposition, and as a means of impressing the people with the extent and grandeur of the mechanical department of the great Exposition to take place in 1876, it is the earnest desire of the managers to make this display of art and industry superior, in point of attraction and practical benefit to all concerned, to any display of a similar character which has ever been held in this country. The Pennsylvania Railroad have loaned their freight depot, at the corner of Thirteenth and Market streets, for the exhibition. It will be thoroughly renovated and tastefully decorated, and will afford ample accommodations for exhibits and visitors.

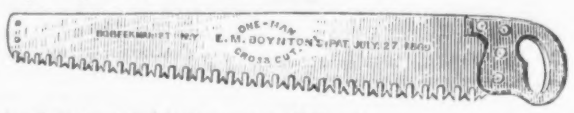
Lightning Saw Tooth; two Points Dressed to Cut in Line on one side of Kerf and two on the Other.

Our Frame Factory is at Present Running Exclusively on this Frame.

It is made of the best stock, and in the most careful manner. I have purchased all the patents and all right to manufacture this original Brace Frame.



Fifteen thousand just received at warehouse in Beekman street. They are much better finished than heretofore, and guaranteed equal to any Braced Frame in the market. My purchased patents ante-date all other varieties of Cross Brace. Price to the trade, $10 per dozen, complete with Lightning Blades and Patent Stretchers.



For 3½ feet will be furnished to the trade at $2·25, net.

We are making Files to fit and file out the center of the Lightning Tooth, like the above cut which shows how an inch of steel is economized instead of a scraping point, thus giving thrice the durability of V teeth.

Note, two direct cutting edges dressed to cut in line instead of one scraping point. Awards have been made in 1872, American Institute Fair, New York, special medal of award over all other manufacturers. 1873, silver medal, the highest award voted over all.

Since the date of my first patent, Nov. 27, 1866, several of the large saw manufacturers, after opposing, ridiculing and endeavoring to crush out my Lightning Saws, have at length paid me the tribute of imitating my goods and infringing upon my patents. They can sell inferior goods at lower prices, and there is no excuse for their breaking the laws of the country, and seeking to rob inventors of their hard-earned rights and property. The fact that these men have amassed millions from patent machinery and inventions of others, gives them no right to use such gains to rob and oppress inventors. The Government did not protect their patents, nor the people render them their wealth for any such purpose. Believing, as I do, that right will triumph in the end, I am pushing my cause in the United States courts of equity to a speedy, and, I trust, successful conclusion, so that a single suit may settle the question for all persons who make, sell, or use my goods in defiance of patent law. But even if sure retribution does not always follow the criminal, what high-toned merchant wishes to sell infringements knowingly? The public conscience must support the right, or law is valueless, and the rights of the lofty and lowly have alike one foundation. NO MAN CAN AFFORD TO DO WRONG.

Wealthy saw manufacturers may pay legal costs, but cannot shield the consciences of their customers, and the meanness of a wrong is increased by chances of escaping detection and punishment.

For the information of the public, I submit the following letter of my Attorney, which explains itself:

E. M. BOYNTON, Esq., 80 Beekman street, N. Y.

DEAR SIR: We have received your letter asking our opinion as to the validity of the claims in your Re-issue Letters Patent, No. 3566, for the M shaped cutting teeth described therein. Your original Letters Patent, No. 59,051, dated November 27, 1866, contain the said invention and consequently the Re-issue was legally and properly granted.

The invention referred to is secured by the first and second claims, and in our opinion both said claims are valid. The first is, in substance, for the M shaped tooth provided with cutting faces.

The second claim covers such a tooth having its cutting points dressed to cut in line on the same side of the kerf, and so on with each succeeding tooth, successive teeth cutting on opposite sides of the kerf from each other, but the cutting points of each tooth are dressed to cut on one side only of the kerf.

The said claims are, in our opinion, good and valid, and any persons making, selling or using the devices and constructions specified therein without license from you, are infringers of your Patent and are liable to suit, since the Patent was properly granted, and no anticipation of the improvements above referred to has been found, so far as we are aware, which cast any doubt upon either of said claims, or upon the correctness of the action of the Patent Office in granting the same. Yours, truly,

VAN STANVOORD & HAUFF, Solicitors of Patents, 41 Park Row, N. Y.

B. F. BUTLER, Washington, D. C.

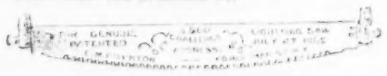
ANSWER TO HENRY DISSTON.

The reason no one can take my $500 TEST Challenge, is manifest when on the 25th page of last week's issue of this paper, we find, that if any one will conceal a V obstruction between points of my Patent M tooth, a "saw will cut four times as fast," as if its points were all of the old V teeth.

Henry Disston stakes his reputation on this recommendation of my goods.

If an adulterated Lightning (dubbed Great American) "will cut four times as fast as the common tooth" used by other Saws, what, then, will my genuine Patent Lightning do?

"If such the sweetness of the stream,
What must the fountain be."



I shall be ready, willing and extremely anxious, on proper notice, to accept a challenge from H. Disston or any saw manufacturer, and am ready to back my words with appropriate deeds and $500 expense, if beaten. N. B. With Hand, Billet or Cross Cut Saw, $500 on each.

E. M. BOYNTON, 80 Beekman st., N. Y.

Special Notices.

Wanted.

A young or middle aged, active and energetic partner, with $6000 to $7000 capital, in an old established and well paying retail Hardware business, situated in one of the most thriving towns in Western New York. Satisfactory reasons given. Best of references given and required. Address, S,
Office of *THE IRON AGE*, 10 Warren St., N. Y.

R. T. HAZELL, AUCTIONEER.

By R. T. Hazell & Co.,

Store No. 94 Reade Street.

Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.

CASH ADVANCES made on CONSIGNMENTS without additional charge.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at *99 Cannon Street, London, E. C.*

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Special Notices.

Commercial Travelers,

ATTENTION!!

Odd Hours made Profitable.

Those having trade with dealers in Hardware, Tin and Stoves, House Furnishing Goods and China, also with Confectioners, Hotels or steamers, in any part of the United States and Canadas, can hear of a good selling article (complete outfit, eight ounces, sent by mail. No sample required), by addressing with good references, and stating location of trade.

Philadelphia P. O. Box, 2130.

Next July a well known firm of Engineers and Machinery Agents, with large connections at home and abroad, will open a ground floor warehouse, having windows fronting Queen Victoria Street and Cannon Street, London, E. C. The firm is prepared to accept the agency for special machinery, tools, &c., and to exhibit a choice selection of these, and of working models. Advertisers' travelers canvass Great Britain and the whole of Europe. For terms, apply to *W. P. L., Office of The Iron Age,* No. 0 Warren Street, N. Y

Special Notices.

ROLLING MILL.

We have the machinery for a bar mill, which we wish to put in operation at Lockville, Chatham county, North Carolina. Lockville is on the Raleigh and Augusta Air Line Railroad and the Deep River, ten miles below the Egypt Bituminous Coal Fields. The climate is mild and the location desirable. A mill at that place would command all the local trade of the State. A person or persons having a knowledge of the business, and capital sufficient to work it, wanted to take an interest. Inquire of

J. M. HECK, Prest.
Deep River Mfg. Co., Raleigh, N. C.
Or **GEO. G. LOBDELL,**
Wilmington, Del.

Wanted.

A traveling salesman who is thoroughly familiar with the Hardware business, and can bring satisfactory reference. One acquainted with the New England trade would be preferred. Address,

P. O. Box 1997, New Haven, Conn.

A Manufacturing Company,

Employing traveling agents, is desirous of securing the agency of some articles of Heavy Hardware to be sold in connection with their own Manufactures.

Address, **A. B.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

Established 1859.

H. R. IVES & CO.,

Successors to IVES & ALLEN,
Manufacturers of

Builders' and House Furnishing HARDWARE.

Also Manufacturers' Agents.

Having a most extensive connection throughout the Dominion, and keeping a number of first-class salesmen upon the road all the time, we can offer superior inducements to American manufacturers for placing their goods in this market.

Consignments of American Hardware solicited. N. B.—Sales confined to the jobbing trade.
Address, **H. R. IVES & CO., Montreal, P. Q.**

A man with over 20 years' experience in the manufacture of Iron, a thorough, practical draughtsman, Civil and Mechanical Engineer, at present in charge of the construction of a blast furnace in the South, will be open to engagement shortly.

Address, *IRON MASTER,*
Office of The Iron Age,
No. 10 Warren Street, N. Y.

Katahdin Charcoal Pig Iron.

O. W. DAVIS, Jr., Manufacturer, **Portland, Me.**

Furnace in Piscataquis County, Me., for Car Wheels, Steam Cylinders, Boiler Plates, Hydraulic Presses, Plows, Chilled Rolls, and any purpose requiring great strength.

South Boston Tests, Katahdin Pig Iron.

No. 2,	density,	7·202;	tensile strength	per square in.,	19,894
No. 3,	"	7·243;	"	"	26,928
No. 4,	"	7·235;	"	"	30,765

Shipped by rail or water from Bangor or Portland. Samples and analyses furnished on application.

A. PURVES & SON,

Corner South & Penn Streets, Phila,
Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.

Cash paid for all kinds of **Metals** and **Tools.**

STERLING IRON & RAILWAY CO.

SHIPPERS OF

STERLING MAGNETIC IRON ORE

FOR BLAST AND PUDDLING FURNACES.

A. W. HUMPHREYS, Treas.,
42, PINE ST., N. Y.

To the Trade.

HARDWARE TRADE REGISTER.

1874

Owing to the backward state of trade occasioned by the late panic, we have deemed it advisable to defer the issue of our Trade Register until a later period than usual in order to give its benefits to the trade of next season.

It having come to our knowledge that certain parties, evidently having no reputation of their own, are endeavoring to trade upon our already established reputation, by assimilating our title, and even, in some instances, from what we understand, using our last edition for canvassing purposes, we respectfully announce to the trade that we are now canvassing for our next edition, which will contain additional features of interest calculated to make it still more valuable than it already is, and render it indispensable as a work of reference to the trade, **and we ask them to withhold their advertising favors until our agent may call upon them.**

Please Notice that we always have a printed form, bearing our address 4 & 6 Warren St., for orders for advertisements, and that they are payable only to the order of the Manager.

The Merchants and Manufacturers Agency,
(MERCANTILE.)
No. 4 & 6 Warren St., N. Y., Publisher.

CAUTION

No advance payments required for regular advertisements; but **all small matter is payable in advance.** And our only authorized agents to collect money are invariably provided with a certificate of authority, bearing our official seal, and signed by the manager, and are instructed always to give our printed receipt stamped with our seal and countersigned by the party receiving the money.

S. W. THOMPSON, Manager.

TO INVENTORS.

Patents secured in the United States and Europe, on the lowest terms and very

PROMPTLY,

by **A. V. BRIESEN,** Solicitor of Patents and Attorney at Law in Patent Cases.
258 Broadway, N. Y., cor. Warren St.
Consultation gratis.

Special Notices.

Wanted.

An equal partner with $10,000 or $15,000 to commence the manufacture of a recently patented Car and Wagon Spring, the lightest, best and cheapest Elliptic Spring made, corroborated by Railway Officials, Supply and Spring Dealers. Sale positive. Inventor prefers to take entire charge of manufacture, outside business, also, if desired. Full particulars by addressing, **J. E. JEFFREYS,**
114 Throop Avenue,
Bet. Whipple & Bartlett Sts., Brooklyn, E. D., N. Y.

A gentleman who has been traveling in the South for eight years past, for an English cutlery and hardware house, and who is thoroughly acquainted with the hardware, house-furnishing and notion trade from Baltimore to San Antonio, Texas, desires to make a new engagement. Address, with particulars, *J. W. S., Office of The Iron Age,*
10 Warren Street, N. Y.

WM. E. TANNER & CO.,

Metropolitan Works.

Manufacturers of

Steam Engines, Boilers and other MACHINERY,

Canal St., from 6th to 7th, Richmond, Va.

In addition to a full line of new engines, boilers, saw mills, and other machinery of our own manufacture, we have now on hand and will sell at very moderate rates, the following lot of **second-hand machinery,** viz.:

3 Double Hoisting Engines, suitable for mining, tunnelling or other purposes. Each of these engines has two cylinders, 7½ in. diam. by 18 in. stroke; two drums, 4 ft. diam. by 4 ft. long; geared to engine in proportion of 8 to 1, and are provided with disconnecting gear and friction brakes.

One 150 Horse-Power Stationary Engine, with heavy fly wheel, all complete, and nearly as good as new.

Three Return Tubular Boilers, (70 three inch tubes each), 15 feet long, complete with steam drum, fronts, valves, grates, &c., suitable for the above engine.

One 10 Horse-Power Portable Engine of our own make, complete, with two driving pulleys, "Judson" governor, &c., nearly new, and in excellent order.

One 30 Horse-Power Portable Engine, with circular saw mill, saw and belt complete, in first rate order.

Three 4 Horse-Power Stationary Engines. Cylinder, 4 in. by 10 in.

One 30 Horse-Power Stationary Engine, as good as new, complete, with "Judson" governor, fly wheel, &c.

One 30 Horse-Power Stationary Engine, in good running order, but not as new as the above.

One 16 Horse-Power Stationary Engine, with new vertical boiler.

One Otis Hoisting Engine, in good order.

Two Flue Boilers, 26 ft. long, 42 in. diam., each with two 14 in. flues, iron front, grates, &c., in good order.

One Flue Boiler, 34 ft. long, 48 in. diam. with two 14 in. flues, about as good as new.

One 7 Horse Portable Engine, of our own make, used only a few months, and in perfect order.

Two No. 6 Sturtevant Blowers. Two No. 4 McKenzie Blowers. One No. 6 Andrew's Centrifugal Pump. One No. 6 Turbinate Centrifugal Pump. Three No. 0 Cameron Pumps. One No. 2 Cameron Pump. One Knowle's Pump. One Earle Pump.

Thirty Brass Tubes, 1¾ diam., 12½ ft. long.

Send for illustrated catalogue and Price Lists.

J. M. WHITE,

Architect and Constructor of Charcoal Blast Furnaces. Plans, Specifications and Estimates of construction furnished upon application.

Office address,
FON DU LAC, WIS.

Weekly Spanish Market Review.

The undersigned issues the only extensive Spanish Colonial produce report printed in America, its 16th, April number being the 133d published. It appears simultaneously on *El Cronista* and in *letter sheet form.* Thirty five order-giving houses of the first-class in the city, are now subscribers to the latter. They forward the same in their correspondence to all Spanish American countries, to Brazil, Spain and Manila, together with a prices current, on which, under a special arrangement, leading ***Hardware, Paint*** and ***Oil*** houses are quoted. The review, although not pretending to be an advertising medium, is thus of great value to the party quoted. A copy with full particulars will be forwarded to manufacturers desirous of thus pushing their interests in South America, etc. Address,

C. KIRCHHOFF,
Commercial Editor "El Cronista,"
Box 2806 P. O., N. Y.

High Grades

BOILER PLATE IRON,

Locomotive Tank Iron,

FIRE BOX IRON,

And plates of every character and variety, and of all the higher grades of Iron, from one-half inch thick to No. 18 W. G., rolled to specification.

Also, High Grades Bar Iron

Of refined and double refined qualities, and of all sizes, rolled to order.

Having a productive capacity of 50,000 tons per annum, we are prepared to fill large specifications promptly, while our Irons, being neutral in character and uniform in their working qualities, need but a trial to ensure their continued use.

Rolled Railroad Axles a specialty.

Consumers' Direct Trade solicited.

Catasauqua Manufacturing Co.,
Catasauqua, Pa.

REPRESENTED BY

Theo. Sturges, 240 Pearl St., N. Y. **Geo. B. Atlee,** 333 Walnut St. Phila.

THE CANADIAN BANK OF COMMERCE.

Capital - - $6,000,000, Gold.
Surplus - $1,500,000, Gold.

The New York Agency, No. 50 Wall Street, buys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.

J. G. HARPER,
J. H. GOADBY, } Agents.

Banking and Financial.

Banking House of Fisk & Hatch No. 5 Nassau Street, New York.

We buy and sell Government Bonds and Gold at current market rates; buy Gold Coupons; buy and sell Stocks and Bonds at the Stock Exchange on Commission for cash; receive deposits, and allow interest at the rate of four per cent.; make Collections, and transact a general Banking and Financial business.

We also deal in the Central Pacific and Western Pacific Gold Bonds, which are very desireable for investment.

The Central Pacific Trunk Line Road, with an average monthly revenue exceeding $1,000,000. The Company have a small unsold balance of their Six per Cent. Gold Land Bonds, with the proceeds of which, and their surplus earnings, after paying expenses, interest, and dividends, they are adding to the permanent improvements of the road. The amount is less than $800,000; we are selling them at 85 and accrued interest, and consider them an excellent investment.

Fisk & Hatch.

Special Notices.

Iron or Nails Wanted,

In exchange for

100 Tons No. 1 Wrought Scrap Iron.

Address **GILCHRIST & GRIFFITH,**
Mount Pleasant, Iowa.

DAYTON & LAMBERSON'S

(Copyrighted **Standard** Lists.)

DISCOUNT BOLT LIST.

Book form, Common and Philadelphia Lists, 20 discounts.

DISCOUNT SCREW LIST.

Iron Screws, 13 discounts.

PRICE REDUCED.

Bolt List, 60c.; Screw List, 50c. per copy. Address,
DAYTON & LAMBERSON, 83 Duane Street, N. Y.

Situation Wanted

By a young married man, as salesman in a wholesale or retail hardware store; has had seven years' experience. Speaks English and German. Can give best of reference. Address, **HARDWARE,**
Box 709, Elkhart, Ind.

Wanted,

A Good Second-hand Engine,

four to five feet stroke from twenty-two to thirty inch bore. Send description and price, until May 15 to **H. HAMILTON & CO,**
Youngstown, Ohio.

To Mining Companies, Manufacturers and Engineers.

My son has just graduated at the Royal School of Mines, Clausthal, Prussia, and I wish to place him either as an Assayer, Mining Engineer or Draughtsman. His double Diploma as Mining Engineer and Metallurgist is open for inspection.

C. KIRCHHOFF,
Commercial Editor "El Cronista,"
Box 2806, N. Y.

For Sale, &c.

For Sale, Steam Engine.

500 Horse Power; Cylinder, 36 in.; Stroke, 4 feet; Condenser; Wrought Iron Shaft; 25 ton Fly Wheel.

Made by HEWES & PHILLIPS, Newark, for the Fagin Flour Mills; used scarcely any. Gave best results ever attained in flouring.

Apply to **HENRY HILL,**
Late FAGIN & CO,
P. O. Box 226, **Newark, N. J.**

Narrow Gauge Tank Locomotive

FOR SALE,

2 ft. gauge, suitable for quarry or blast furnace use. Weight 9 tons, cylinders 9x12, steel tyres, black walnut cab, &c. Everything fitted up in first-class style, entirely new. Address,

WARD, STANTON & CO., Newburgh, N. Y.

Blast Furnace Plans.

A complete set of working drawings For Sale, from which the North Chicago Rolling Mill Co.'s and Milwaukee Iron Co.'s furnaces were built. The furnaces are 66 ft. high and 17 ft. across the bosh, and are the largest producers and most economical furnaces of their size in the United States. They are adapted to use anthracite, bituminous, raw coal or coke.

For Sale by
JAMES HENDERSON, 30 Broadway, N. Y.

EXECUTORS' SALE

OF

Valuable Mineral Land.

The undersigned, Executors of *Eliza A. Crane,* deceased, will sell at Public Auction on *Wednesday, the 13th day of May* next, at 1 o'clock P. M., at the Court House in *Morristown, N. J.*, the **Valuable Iron Mine,** known as the

SCOTT HIBERNIA MINE,

Situated at **Hibernia, Morris Co., N. J.** Now leased and worked by the *Glendon Iron Co.* The mine has been worked about 25 years, and is now in good working condition and capable of producing at least 10,000 tons of first quality ore per annum. For terms of sale, apply to

EDWARD LE DOBBINS, or
BENJ. F. CRANE, Newark, N. J.

IRON FOR SALE.

Manufactured by the

ULSTER BLAST FURNACE,

NAPANOCH, N. Y.

Samples and prices with,
M. M. PILLSBURY, 85 John St., N. Y.

HARDWARE STORE.

For Sale, a first class Tool and Hardware business, situated in the best business part of Jersey City. Established about 25 years, and in flourishing condition. Apply to **H. LUTTGEN,**
57 Montgomery St., Jersey City.

Valuable Iron Works, For Sale.

The undersigned offers for sale the Iron Works in Pottsville, Schuylkill County, Pa., known as "The Washington Works," consisting of a

Large Stone Machine Shop & Foundry,

Brick Pattern House, Erecting Shop, Stone Blacksmith Shop, Brick Office, and Lot of Ground containing in front 195 feet 3 inches, and in depth 260 feet.

There will be sold with the above a large and valuable collection of Patterns, Heavy Crane Flasks and Heavy Core Spindles for making heavy Castings and Pipes of all sizes; Turning and Planing Tools.

The Works can be put in immediate operation. A favorable opportunity is here presented for enterprising men. The demand for Castings and Machinery is constantly increasing in this region. The property will be sold on liberal terms. ***If not sold in a reasonable time it will be for Rent.***

For particulars apply to
J. W. ROSEBERRY, Trustee,
Pottsville, Pa.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, April 29, 1874.

During the past few days there has been some recovery from the depression of the financial markets reported in our last issue, with a considerable recovery of prices from the figures to which they dropped so suddenly with the break in the stock market. The failure of the Senate to pass the Currency bill over the President's veto, settles the question of an increase of legal tenders during the remainder of President Grant's term, but as it opens the way for free banking, the country will probably gain more in the end than it would have gained from the enactment of the Senate bill, hampered as it was with conditions and provisions which would have nullified its important provisions in a great measure.

The money market, which was unsettled early in the week, has become steady, with 3 @ 5 per cent. as the rates on call loans. Prime mercantile paper is fairly quotable at 5½ @ 7 per cent., and is in good demand.

The gold market has been very irregular, with the following as the highest and lowest daily quotations:

	Highest.	Lowest.
Thursday	113⅛	112¾
Friday	112¾	111⅝
Saturday	112⅞	112⅛
Monday	113¼	112⅛
Tuesday	113⅜	113
Wednesday	113¼	112⅞

In the stock market the principal dealings have been very large, both for speculative and investment account, chiefly in Western Union, Lake Shore, Union Pacific, Pacific Mail, C., C. & I. C., Northwestern and N. Y. Central. The highest and lowest of to-day's prices on 'Change are given below.

The bond market has moved in close sympathy with gold. Governments are firm in London. Investment bonds are in better demand, and close strong and steady. We give below the closing prices of governments.

The following shows the movements in foreign trade for the week:

IMPORTS.

	1872.	1873.	1874.
Total for week	$9,573,956	$10,340,763	$7,228,874
Prev. reported	136,128,064	139,526,585	130,944,397
Since Jan. 1	$145,702,020	$149,867,348	$138,173,181

Included in the imports of general merchandise for the week are:

	Quant.	Value.
Anvils	6	$80
Brass goods	8	4,113
Bronzes	4	464
Chains and anchors	51	2,125
Copper		415
Cutlery	64	24,883
Guns	144	8,095
Hardware	41	6,678
Iron pig, tons	1,100	26,179
R. R. bars	8,594	188,974
Iron cotton ties	105	1,622
Iron, other, tons	110	6,920
Lead, pigs	2,220	14,433
Metal goods	168	11,392
Nails	1	257
Needles	10	7 861
Old metal		6,473
Plated ware	1	98
Per caps	2	311
Saddlery	3	407
Steel	1,843	17,997
Silverware	2	468
Tin, boxes	12,939	112,015
Tin, 4,302 slabs	296,234	62,495
Wire	13	2,634
Zinc	166,623	12,851

EXPORTS EXCLUSIVE OF SPECIE.

	1872.	1873.	1874.
For the week	$3,244,186	$5,355,290	$7,295,229
Prev. reported	64,801,504	81,767,856	83,213,721
Since Jan 1	$68,045,690	$87,123,146	$90,508,950

EXPORTS OF SPECIE.

Total for the week	$423,237
Previously reported	9,549,661
Total since January 1, 1874	$9,972,898

So far as the relation between reserve and liabilities is concerned, the banks are stronger than last week, the decrease in total liabilities having been more than four times the loss in total reserve. The banks now hold in what is reckoned as lawful money $12,728,925—above 25 per cent. of their total liabilities—against $11,957,700 so held last week. The following are the figures showing the averages of the past two weeks with resulting differences.

	April 18.	April 25.	Differences.
Loans	$293,464,700	$288,423,500	Dec. $5,041,200
Specie	23,213,600	23,336,400	Inc. 122,800
Leg. Ten.	55,163,900	54,739,600	Dec. 424,300
Deposits	238,888,900	234,486,700	Dec. 4,352,200
Circ'lation	26,840,300	26,901,600	Inc. 61,300

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	98⅛	98⅛
Lake Shore	78⅛	76⅞
Rock Island	100⅛	99⅜
Del. Lack. and Western	107	106⅜
Wabash	43¼	41⅞
Western Union Telegraph	75⅞	73⅞
Northwestern	48⅝	46⅝
Milwaukee & St. Paul	39⅝	37⅜
Pacific Mail	46⅞	45¼
Erie	36⅛	34⅜
Ohio & Mississippi	27⅝	29⅜
Union Pacific	35⅝	34⅜
C. C. & Ind. Central	22⅝	22
Atlantic & Pacific Preferred	15	14¼
Hannibal and St. Joseph	31¼	30
do. do. Preferred	36	35

Government bonds at the close were firm at the following quotations:

	Bid.	Asked
U. S. Currency 6s	116¼	116⅝
U. S. 6s 1881, reg	120	120⅛
U. S. 6s. 1881, cou	122	122¼
U. S. 1864, 5-20 reg	115⅛	115⅝
U. S. 5-20 1862, cou	118¾	119
U. S. 5-20 1864, reg	116⅜	117
U. S. 5-20 1864, cou	120⅝	120⅞
U. S. 5-20 1865, reg	116¾	117
U. S. 5-20 1865, cou	121¾	122
U. S. 5-20 1865, reg. new	119⅜	119⅝
U. S. 5-20 1865, cou	120¼	120½
U. S. 5-20 1867, reg	119⅞	120⅛
U. S. 5-20 1867, cou	120⅜	120⅝
U. S. 5-20 1868, reg	119⅜	119⅝
U. S. 5-20 1868, cou	120⅜	120⅝
U. S. 10-40 reg	115⅜	115⅝
U. S. 10-40 cou	115¾	115⅞
U. S. 5s 1881 reg	115¾	115⅞
U. S. 5s, 1881 cou	116⅞	117

GENERAL HARDWARE.

Trade seems to have fallen off this week, although some houses report a fair business. The weather during almost the entire week has been very bad, and this must necessarily have had a great effect on trade. In the matter of changes in price there is little to report. A number of goods are becoming scarce, especially agricultural tools. These are made in advance of the season when they are sold, and this year the panic had the effect of reducing the production so much that this season was begun with a much smaller stock than usual, and one not sufficient for the demand. We hear of some other manufacturers who are behind their orders; but they are not as numerous as usual at this season.

In the management of the New York warehouse of the Russell & Erwin Mfg Co., Richard P. Bruff, who has resigned, is succeeded by Mahlon J. Woodruff, Assistant Treasurer, who was formerly in charge of the works at New Britain. This company have just added to their line of Padlocks a new 2½ inch steel key tumbler Padlock, with fancy bushing, 6 changes to the dozen, listing at $4 per dozen, less the regular discount.

The Reading Hardware Co. have just issued a circular announcing that they have commenced the manufacture of the "Reading Improved Grindstone Fixtures." These goods are made under the same patents as their "Keystone" Grindstone Fixtures, and are sold from the following list at a discount of 66⅔ and 10 per cent.:

No. 02½, 15 in. shaft	per doz. sets,	$18·00
No. 03, 17 "	" "	21·25
No. 03½, 19 "	" "	23·80
No. 04½, 24 "	" "	28·00

There has been some uncertainty as to the price at which Apple Parers would be offered this Spring, but it now seems to be settled that it will be $8·50 per dozen, with the usual discount for 50 dozen lots, for the Lightning, Turntable and Reading, also for a new machine which S. Otis Livingston, No. 113 Chambers street, has now for the first time placed on the market. This machine is called "Hudson's Rotary Apple Parer, with push-off attachment," and possesses important points of excellence. In appearance it is somewhat like the Turntable, from which, however, it differs in its working position, the new machine being worked in an upright position, while all others, except Conqueror (now obsolete), are worked in a horizontal position. In "Hudson's Rotary" the parings fall entirely clear of the gearing, and any danger of clogging is obviated. Last year this machine, without the important improvement of a push-off attachment, was placed upon the market, and met with a favorable reception from the trade. In its improved form for 1874 the manufacturers in a circular, about to be issued, express the assurance that this "Parer will pare "its own way into the confidence and good will "of the entire community." These goods are packed in boxes of one dozen each, and the price is fixed at $8·50 per dozen, net.

A suit of C. B. Rogers & Co. against John B. Roberts was tried in the U. S. Court some time since, and defended with the view to escape the penalty for infringement on the Boardman patent for improved Blind Staples. A decision has just been rendered in favor of the plaintiffs, sustaining the patent. This is the second suit that has been defended with the same results. Several other suits were commenced and judgments taken without defence. The heavy expense attending these suits is not calculated to make the owners of this patent very amiable, and we are informed that it is their intention to prosecute all parties who have either sold or consumed Serrated Blind Staples not made by themselves. The Hart, Bliven & Mead Mfg. Co., of New York, discontinued making Serrated Staples several years since, and became interested in the manufacture and sale of the genuine Boardman's Staples, which they will offer for sale during the entire term of the patent at quantity prices and discounts.

The price of Copper Rivets and Burs continues to be quoted at discount 10 per cent., and some manufacturers refuse to sell at better figures; the market, however, is somewhat demoralized, and these goods have been sold within a few days at prices ranging from 10 to 25 per cent. discount—the latter, we believe, is the lowest figure reached.

Trade in Foreign Hardware shows no improvement over the dullness of the preceding week. Contrary to the general expectation, mail advices from the English market have so far failed to chronicle any important declines in heavy or shelf goods. A few weeks since we noted an advance on the sterling price for common and medium class Razors, and mentioned that no change had taken place in the higher grades. We were shown a letter from Sheffield, received in this city to-day, which reports a strike among the Razor blade forgers, which has, in the case of some of the makers of first-class goods, terminated in favor of the men. The letter referred to contained the following extract from a Sheffield paper of recent date:

THE STRIKE IN THE RAZOR TRADE.—The strike of forgers in the razor trade is resulting in favor of the men. As already stated, they asked for an advance equivalent to about 4/6 per week, and the manufacturers refused to grant it. As stocks of forged blades are low, and as the other branches of the trade must have shortly been thrown idle if the dispute had continued, Messrs. Joseph Rodgers & Sons have conceded the advance demanded, and the men resumed work yesterday morning. It is more than probable that the other manufacturers will now consent to give the advance.

As this information came to hand late this afternoon, we are unable to say how far prices will be affected.

Beam & Murray have removed from their old stand, No. 54 Cliff street, to more commodious quarters in No. 93 Chambers street, between Broadway and Church streets.

T. F. Cherritree & Co, No. 113 Chambers street, have added to their line of Hardware specialties "The Diamond Box Coffee Mill," which is worthy the attention of the trade. This Mill is all iron, the hopper, with its grinding apparatus, slides upon and forms a cover for the box, which is easily attached or released by a simple mechanical contrivance. The advantages claimed for this Mill over the ordinary Box Mill, with wood bottom and drawer, is its greater durability and the ease with which it is kept clean. It costs no more than an ordinary Box Mill, and we are informed by the manufacturers that the best materials are used in the construction of its working parts. These Mills are packed in cases of one dozen each. Price, $4 per dozen; discount, 10 per cent.

There is nothing new to report about the condition of the Nail market. Trade continues fair for small lots. Although the price is nominally $4, net, for 10d., orders for 100 kegs and over are easily placed at $3·90.

In House Furnishing goods, Tinners' Trimmings, etc., there is little doing, and prices remain without quotable change.

The price of Clothes Wringers, which has for some time been irregular, has been, we are informed, fixed, as regards the jobbing price, the large trade throughout the country having settled upon a basis of $68 per dozen, net, in less than three dozen lots, for all Cog-Wheel Wringers. This classification would include the following: "Universal," "Novelty," "Sherman," "Reliance," "Providence" and "Monitor," and we have altered our quotations of these goods to correspond with the above mentioned figures; for larger lots, a concession from this price would be made. It is not likely that any important change in price or manner of selling will be adopted for Clothes Wringers before the next regular meeting of the manufacturers in July.

The manufacturers of Cordage reduced the price of Sisal and New Zealand Rope one cent per pound on the 28th inst. The price of Manila remains as before. The following are the revised prices, which are subject to the usual discount to the trade:

	Per lb.
Sisal Rope, sizes above 12 th'd	14½c.
" 6 th'd and 9 th'd	15½c.
" 12 th'd and Hay Rope	15c.
New Zealand Cordage, sizes above 12 th'd	14c.
" " 6 th'd and 9 th'd (¾ and 5-16 inch)	15c.
New Zealand Cordage, 12 th'd (⅜ in.) and Hay Rope	14½c.

We have received from A. B. Shipley & Son, Philadelphia, manufacturers and agents of Hardware, etc., a price list of Chalk and Fishing Lines, Fishing Rods, Tackle, etc., manufactured and for sale by them, which will be of great use to those of the trade who deal in those articles. It is illustrated, and a careful examination enables us to speak advisedly when we say it is the most complete list of such goods we have seen.

Charles E. Little, No. 59 Fulton street, quotes his Coopers' Tools at discount 20 @ 25 per cent. instead of 15 @ 20 per cent., as formerly.

Nathaniel B. Sherman, of Middleboro, Mass., has leased his Shovel business, which will in future be conducted under the style of The Middleboro Shovel Company. No change will be made in the existing patterns or brands. J. Clark Wilson & Co. will continue to act as agents for these goods, which they quote at discount 12½ per cent. from new list.

We are authorized by Henry Disston & Sons to state that they will, from week to week, make such changes in their advertisement in this paper as will familiarize the trade with the great variety of useful and labor-saving tools manufactured by them. These will be comprehensively illustrated, and their uses and operation fully described. Their advertisement will be found on the 25th page.

Bruce & Cook, the well known importers of Tin Plate and Metals, have recently added to their business a department for the purchase of Old Metals, which will be taken in exchange for goods at full market rates. They quote the following purchasing prices for Old Metals, subject, of course, to the fluctuations of the market:

Copper, heavy	19 @ 20
do. light	18 @ 19
Brass, heavy	14 @ 15
Lead	6
Zinc	5

One of the neatest contrivances we have ever seen for putting up goods, has been adopted by the National Screw Company for their Screws. It consists of a box made of one piece of heavy manila paper which can be opened at either end, and requires neither string nor outside wrapper to keep it closed. While it is always easy to open it when desired, it is impossible that it should open of itself. Indeed, we have seen these boxes full of Screws thrown forcibly on the floor, without either opening or breaking them. The Screws of this company are now all put up in these boxes, containing a gross each, which will be found a great convenience by both the retail dealer and the mechanic using them. Very large and prominent figures are now used to indicate the size. Although similar boxes are used for other purposes, the National Screw Company have secured the exclusive right to use them for Screws. Russell & Erwin Mfg Co. are the sole agents for the National Screw Co.

A young man employed by Graham & Haines as a clerk and city salesman, has for some weeks been defrauding them by shipping to his own relatives, to be held subject to his order, goods which were entered on the order books to regular customers, and not entered on the sales book at all. The discrepancy between the two books was soon discovered, but not before he had disposed of about $2000 worth of goods. Upon finding himself discovered he made a full confession, and gave information which has led to the recovery of the stolen goods. He has been committed to await the action of the Grand Jury.

IRON.

American Pig.—The Iron trade continues in all departments to exhibit the same features of dullness that have for so long characterized it. There is absolutely nothing new to report. For the best brands, about $34 @ $35 for No. 1 Foundry is a fair price, and other less known brands could be bought at an important concession from these figures. The demand is smaller than the production, and Iron is accumulating. There seems to be no desire to buy either for consumption or speculation—notwithstanding the cheapness of money and the concessions a cash buyer could obtain. We quote nominally: Foundry No. 1, $34 @ $35; No. 2 Foundry, $30 @ $33; Gray Forge, $27 @ $30.

Scotch Pig.—The transactions during the week have been inconsiderable and the market closes very heavy. We quote: Coltness, $39 @ $39·50; Glengarnock, $37 @ $38, and Eglinton, $35·50 @ $36.

Bar.—Refined Bars are in fair demand, but there is no improvement in prices, which range from 3 to 3·3 cents from Eastern mills, according to quality. Pittsburgh Bars have been sold as low as 2½ cents, and are freely offered at from 3·60 @ 3·65 cents.

Rails.—There is no change in Foreign Rails, which we continue to quote $54 @ $58, gold, without sales. In American very few sales have taken place during this month, and such as have occurred have been in small lots. In the East, the prices obtained have been about $60 for heavy sections at mill, while in some sections slightly higher prices have been obtained. Most of the sales have been on long time. Eastern makers are now holding firmly at $60, declaring that they cannot make them for less; but even at this low price they are not making new contracts. Orders are on the market, but the credits offered are objectionable in most instances. More than half the mills in the country are wholly idle; others are running only a part of the time, some on old orders, some re-rolling, and a very few piling up their product; and there seems no very immediate prospect of an improvement.

Old Rails.—We quote $38 @ $39. Some holders are asking $39, but others have offered them at $38, without sales.

Scrap.—We quote $40, from yard, for No. 1 Wrought, without sales.

BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.)

WEDNESDAY, April 29, 1874.

Scotch Pig.—The market is active, with a steady demand and a fair amount of business. Prices are advancing, but there is little change in quotations.

Manufactured Iron.—The market is dull, with small demand and but little business doing. We quote Best Staffordshire Bars £12, but prices are nominal.

Rails.—The demand is increasing; prices are firm, and the amount of business fair. We quote Welsh Rails, £8. 10/ @ £9.

METALS.

Copper.—The market has been a gradually rising one, and 300,000 pounds Lake have changed hands during the week, in lots, commencing at 24½c., then improving to 24⅝c., and finally, yesterday and to-day, with sales in round parcels at 24⅞c. The feeling has been strengthened by the stormy, untoward weather, supposed to have been as bad as it can be at this time of the year in the Lake region. It is now calculated that no fresh supplies from the Lake can reach us before the 5th or 10th of June. The *Mining Journal*, of April 23d, has the following intelligence: "The weather outlook is gloomy enough. The season is not as far advanced as it was last year at this time. The ice in Keweenaw Bay is solid, while that in Portage Lake is of a character to resist moderately mild weather for some days. The mail stages are still using the ice on Keweenaw Bay for about fifteen miles." We called on the representative of the leading Lake interests, who was good enough to show us the following passage from a private letter dated Detroit, April 27th: "The prospects for the opening of navigation on Lake Superior are not promising." Nothing has transpired in contracts for forward delivery, for which 25c. is asked. We quote May to September, inclusive, nominally 24½c. to 25c. Spot goods are firm at 24¾c. to 25c. The dealing firms report a better demand from consumers, who are light-stocked, and will probably enter the market more freely in view of the facts at hand. The idea of Europe declining to a point low enough to admit of the importation of Copper seems to have been altogether abandoned, if it had been seriously entertained at all. Later cable news we have been unable to learn, and the inference is that there is no change. The Continental accounts by mail do not dwell upon Copper as specially under a cloud, nor do they attach as much importance to the lately heavy charters on the West Coast as the English advices led us to infer; on the contrary, they represent Copper as affected by the general metal prostration, and no more. The entire tone of the Continental iron and metal advices to hand is rather more cheerful, and it is fair to presume that the worst had been gone through; at all events, it may mislead us if at this juncture we adopt too exclusively the English view of the case. The manufactures of copper are sustained at our previous quotations, to wit: Copper Bolts, 35c; Sheathing (over 12 oz.), 33c.; Brazier's (over 16 oz.), 35c.; Yellow Metal is steady at 24c. per pound for Sheathing, and 30c. per pound for Bolts, net cash.

Tin.—The day following our last report a heavy drop occurred once more in the English market, and had not been recovered up to to-day, the quotation yesterday being £95, for Straits, and £100, common English, at London. From both Singapore and Penang dispatches are to hand, dated to-day, and both quote $25 per picul, more being asked, but refused. Thus the East India markets have quickly responded to the reduction in England. From Holland we have nothing later per cable during the week. The mail from Amsterdam is to hand, and, according to the tenor of letters we have seen, there was a good consumptive demand, while speculators deemed prices low enough to cover contracts; the subsequent upward turn confirmed the correctness of these views. Our own markets declined ½c. all round, in response to the drop, but there were no sales of moment, owing to the insignificant nature of the available supply, and the market winds up with a fair degree of firmness. The spot quotations are the following: L & F, English common, 21⅝c, gold; ditto, refined, 22¾c.; Straits, 24½c.; and Banca, 26½c., all gold. There have been no sales of afloats, nothing offering below 22c., gold, common English; 23½c., ditto, refined; and 24½c, Straits, all gold. To purchase ten ton lots, the metal being scarce, the following rates would have to be granted on the spot: L & F, 22c.; refined, 23c; Straits, 25c.; and Banca, 27c., all gold. The Tin Plate market has been tolerably active under the stimulus of the Welsh strike and higher cable quotations. The following cablegram was received, dated to-day: "Thirty more works have stopped in Wales. There is to be a meeting of thirty on the 6th proximo. The men are firm, and resolved to hold out. Maker's will name no prices for future delivery." The quotations previously telegraphed from Liverpool were strong at 36/ @ 37/ Charcoal Tin, good brands; 32/ @ 33/ for do. Terne, and 29/ for Coke Tin. Week's sales at New York 8000 boxes, small portion of which "to arrive." The market closes strong as follows: I. C. Charcoal, $10·50 @ $11, gold, per box; I. C. Coke, $8 @ $8·50; Coke Terne, $7·50 @ $8; and Charcoal Terne, $9·37½ @ $9·75, all gold.

Lead.—This metal has been rather quiet, the dealings being limited to the supplying of current moderate requirements. A large lot, some 600 tons Selby, held by a party from California, is on the market and remains unsold, the asking price being 6¼c., gold, for which 6c., gold, might, perhaps, be taken. Some seem of opinion that domestic Lead, of which the stock at St. Louis, New York and Newark is ample, may probably be procurable as low as 5·90c., gold. Foreign continues in light supply at nominally 6½c., gold, for common, and 7c., gold, for selected. The demand for consumption has not yet fully developed, the season being backward, owing to the stormy spring; but with the advent of fine weather this may undergo a sudden and favorable change, and there is a firm undertone to the market, the article being cheaper than it has been for a long time past. We quote domestic, in 10 ton lots, 6¼c., gold, at the close, at which it can be moved to a moderate extent. There are no later European accounts to hand per cable. The mail advices are devoid of special interest, though, on the whole, confident. An easing up of the strain on the general European situation would, it is hoped, benefit Lead at once. The manufactures of Lead are quiet, but steady, as follows: Bar, 8½c.; Sheet and Pipe, 9c.; and Tin Lined Pipe, 16½c. Discount to the trade, 10 per cent.

Spelter and Zinc.—Absolutely nothing worth recording has transpired in the Spelter market. The stock of domestic is ample, not so much at New York as at St. Louis, while of foreign hardly any available supply remains. We quote domestic 7c., currency, in larger parcels, while 10 ton lots would probably bring 7¼c. Foreign may be quoted 6½c., gold, nominally; 10 ton lots would very likely fetch as much as 7c., gold, and larger parcels, "to arrive," might be placed, we think, at 6⅝c., gold. No European cable news came to hand. The mail accounts are by no means despondent; on the contrary, the metal market is looked upon as in good position, and likely to swiftly react upon a general brightening of the skies, and as monetary ease will probably prevail for some time yet on the other side, there will not be money wanting, we presume, to take charge of any one of the leading metals that may have dropped below the cost of production. Sheet Zinc is also dull there at 8¼c. to 8½c., gold, Silesian and Mosselman Sheet; Western, 8¼c.

Antimony is quiet at 12⅜c., gold, with moderate sales at this figure.

OLD METALS, PAPER STOCK, ETC.

Business in this market still continues very dull, and we have nothing new to note. Prices remain the same as quoted in our last report Dealers report a better demand for Canvas Cotton, No. 1, and Linen Rags, as compared with last week. Old Metals are still in over-supply, and dealers are not anxious to purchase any quantity, although nominal quotations are unchanged. The purchasing prices offered by the dealers are as follows:

Old Metals.—Copper, 18c. per lb.; Yellow Metal, 13c.; Brass, 13c. @ 14c.; Composition, heavy, 14c. @ 15c.; Lead, solid, 5½c.; Tea Lead, 5c.; Zinc, 4c. @ 5c.; Pewter, No. 1, 21c.; do. No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1¼c.; Sheet do., ¼c.; Cast, do., ⅝c. @ 1c.; Machinery, do., 1c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No. 1, 6c. @ 6¼c.; No. 2, 2½c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 3c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 6c.; Gunny Bagging, 1¼c. @ 1½c.; Jute Butts, 1⅝c. @ 2c.; Kentucky Bagging, 3c. @ 3½c.; Book Stock, 3½c. Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c. @ 4½c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3½c.; Tarred Shaking, 1c.; Grass Rope, 3½c.

COAL.

The dealers in coal complain that business is not as brisk as usual at this time of the year. Prices of Anthracite remain without change. Domestic trade is limited, and dealers are holding off for fresh supplies by canal, while others were awaiting the public sale of Scranton Coal held to day. Anthracite is selling by the cargo at $5 @ $6 per ton.

The monthly auction sale of Scranton coal was held to day by John A. Draper, at the salesrooms of the Delaware, Lackawanna and Western Railroad. Only 50,000 tons were offered, but the attendance was good, and there was a marked increase over the prices obtained last month. The following table shows the prices per ton at the sales for this month and March:

	Tons.	March.	April.
Steamboat	5,000	$4·50 @ —	$4·62½@4·70
Grate	1000	4·60 @ —	4·72½@4·75
Egg	500	4·82½@ —	4·87½@4·90
Stove	23,000	5·22½@5·30	5·32½@ —
Chestnut	7,000	4·22½@4·25	4·37½@ —

The average increase on Steamboat was 16¼ cents; on Grate, 13¾ cents; on Egg, 6¼ cents; on Stove, 6¼ cents; and on Chestnut, 13¾ cents.

The Market for Bituminous coal has been better this week than for some time past, and

prices are lower. Cumberland coal has declined 25 cents per ton. The quotations are as follows: Pennsylvania and Westmoreland Gas, $7·50, at South Amboy, and $8, delivered here; West Virginia, $7·75; Cumberland, soft, $6·75 @ $7.

Foreign is very quiet and steady, and prices are nominal. The quotations are: Liverpool House Cannel, $19 @ $20; Liverpool Gas, $11; Newcastle Gas, $7·50 @ $8; Scotch, $8 @ $10, currency.

The coal transported over the Cumberland Branch Railroad during the week ending April 25, 1874, amounted to 6415 tons, as against 5181 tons shipped in the corresponding period of last year, showing an increase of 1234 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 51,823 tons, against 49,654 tons shipped in 1873, an increase of 2168 tons.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending April 28, 1874:

Hardware.

Boker Hermann & Co.
Mdse. pkgs., 21
Field A. & Co.
Mdse. pkgs., 10
Friedmann & Lauterjung
Mdse. pkgs., 1
Hilger E. & Sons,
Mdse. pkgs., 2
Lau & Garlichs,
Mdse. pkgs., 10
Noyes & White,
Cases, 2
Page E. & Co.
Wire rope, coils, 507
Russell & Erwin Mfg. Co.
Files, cks., 3
Schoverling & Daly,
Mdse. pkgs., 3
Van Wart & McCoy,
Casks, 1
Mdse. pkgs., 6
Wiebusch F.
Mdse. pkgs., 34
Order,
Files, cks., 3

Iron.

Darrell & Co.
Casks, 1
Barrels, 2
Henderson Bros.
Pig, tons, 750
Naylor & Co.
Fish plates, bdls., 423
Oelrichs & Co.
Scrap, lbs., 2900
Randolph L. V. F.
Rails, 877
Taylor Moses & Co.
Old R. R. bars, 1249

Steel.

Congreve Chas. & Son,
Rails, 1086
Naylor & Co.
Bessemer rails, 575
Mdse. pkgs., 7
Vose, Dinsmore & Co.
Bundles, 108
Order.
Bars, 4
Cases, 3
Bundles, 464
Rails, 1560
Scrap, kilos, 8857

Metals.

Brown Bros. & Co.
Tin, slabs, 338
Bertschmann T.
Tin, ingots, 890
Bruce & Cook,
Tin, ingots, 150
Mdse. pkgs., 1
Castro De D. & Co.
Copper, pc., 1
Dickerson J. S. & Co.
Tin plates, bxs., 3253
Tin, ingots, 622
Darrell & Co.
Copper, pcs., 2; cks., 1
Brass, bbls., 6
Lead, bbls., 1
Grund F. & Cerero,
Lead, bars, 380
Hart L. & Co.
Tin, ingots, 450; bdls, 8
Haxtian B.
Lead, pigs, 8958
Jex Wm. & Co.
Scrap, pkgs., 4
Phelps, Dodge & Co.
Tin plates, bxs., 1728
Tin, ingots, 542
Shepard Sidney & Co.
Tin plates, bxs., 232
Order.
Tin plates, bxs., 1932
Tin, ingots, 880
Scrap copper, lbs., 4500
Scrap, brass, lbs, 1700
Spelter, plates, 1767
Lead, pigs, 1595

PHILADELPHIA.

PHILADELPHIA, April 29, 1874.

There is no improvement to report in the condition of the Iron market in this city, and the amount of business doing is very slight. A very large proportion of the blast furnaces of the State are out, and those running are making as little iron as possible. The uncertainty as to the business future is renewed by the veto, and the shrewdest in the trade decline to give any prophesies for the future. The holders of Pig Metal continue, however, firm in their views, and only a very slight shading of quotations will buy Iron. The mills here are not so active as those further west, where prices are lower. In the present condition of affairs it is idle to speculate on the future, the only thing at all certain being that any demand during the summer will find the country almost bare of Iron. The following rates represent the prices now asked in this market for Iron:

PIG IRON.—No. 1 Foundry, $34 to $35; No. 2, $32 to $33; Gray Forge, $29 to $31, with a dollar off these prices in most transactions.

BAR IRON—3 to 3·2 cts per lb.

RAILS—$60 to $62 for American, at works.

OLD RAILS—$40 to $42.

SCRAP—No 1 Wrought, $38 to $39.

The sales include the usual 10 ton lots of Foundries at our figures; 2000 tons Schuylkill Forge at $26 to $27, at furnace; 300 tons Choice Schuylkill Foundries at $35, here; 1000 tons Rails, $61·50, at works; 500 tons Old Rails, $41, here; 100 tons Old Car Wheels at $34, cash, spot; and 200 tons Scrap at $38, here.

PITTSBURGH.

PITTSBURGH, April 27, 1874.

PIG IRON.—Trade in Pig Iron was a little more active this week, but there is no improvement to note in the general tone of the market, and the demand is still restricted to supplying immediate wants. Notwithstanding the impression generally prevails that prices cannot go much lower, consumers, as a rule, are still adhering pretty closely to the hand-to-mouth policy, buying only when forced to, and carrying just as little stock as they can possibly help. There are various reasons for this, the most important of which is the unsettled condition of the finances of the country. The President's veto of the currency bill has not created as much dissension here as was generally expected. It is true, the majority of our manufacturers contend that there is not money enough in the country to do the business, yet they failed to see that the measure in question would have afforded any relief in the shape it finally passed. What is more particularly desired is that Congress will now take the matter up and dispose of it as soon as possible, or else drop it, as people are afraid to do anything, to enter upon any new engagements, as long as the currency question is in its present unsettled and unsatisfactory condition. There is no branch of trade more affected by this uncertainty than that of Iron, as it requires a large amount of capital to carry it on. Hence, as might be expected, manufacturers are very anxious that the finance question should be acted upon at once. The demand for Pig Iron is curtailed in consequence of the unsettled and unsatisfactory condition of the money market, as consumers are buying only for immediate necessities, notwithstanding prevailing rates do not cover the actual cost of making it, although, in the aggregate, there is a fair business. A number of furnaces west of here, in the Shenango and Mahoning Valleys, are reported as having blown out, but those in this city are still in operation, and turning out a good deal of Iron. It is claimed by some that Pig can be made cheaper here than at the points first mentioned, but this, to say the least, is an open question. No. 1 Foundry Iron may be fairly quoted at $33 to $35, four months; No. 2, $29 to $31; Gray Forge, $26·50 to $27, cash, and $27·50 to $28, four months; White and Mottled, $24 to $25.

MANUFACTURED IRON.—The market continues fairly active, but is devoid of any features of importance to which reference has not already been made. As noted in my last, there is more complaint about small margins than a dearth of orders. It is claimed by some that prices have been put down lower than there was any necessity for; but, be this as it may, there is no doubt but what these low rates have stimulated trade, as they have brought orders here that ordinarily have been filled elsewhere. Quotations are still made on a basis of 2¾c. for Bars, but it is said that some sales have been made as low as 2·65. The mills are all in operation, some of them working up to their full capacity, and the fears which were entertained a few days ago that there would be trouble with puddlers, seem to have subsided, as there has been nothing said about it within the past day or two.

NAILS.—There is a continued steady demand, and while orders are not coming in as freely as they did a couple of months ago, the factories have about all they can do, but, as in the case of iron, it is complained by makers that there is little or no margin at present rates, $3·80 to $3·85, with usual discount of two per cent. for cash. The probability is that the factories, both here and at Wheeling, will have about all they can do during the balance of the season.

STEEL.—A steady demand is still reported, the mills are all busy, and the indications are that this will continue to be the situation all summer; if anything, trade is even better than it was at this time last year, and rates are reported as being pretty closely adhered to.

COPPER.—There is no improvement to note in the demand for Manufactured Copper, and while trade is very dull, what is more discouraging, there is but little prospect of an early change for the better. A meeting of manufacturers is to convene in New York early next month, when there may be some changes made in the scale of prices.

WINDOW GLASS.—Trade is improving, those factories in operation have about all they can do, and this is likely to continue during the balance of the season; no change in rates, 65 to 65&5 per cent. discount off Pittsburgh list. Some additional factories, it is thought, will start up soon, provided the blowers will enter into a written agreement not to strike again.

SCRAP IRON continues dull, and prices are lower. Following are the current buying rates: Old wheels, $28 per gross ton; cast turnings, $12; oily screw cuttings, $15; burnt grate bars and castings, $12; old castings, $25. Old axle iron, 2 cts. per lb.; do. steel, 2¼.

COAL AND COKE.—There is a fair amount of business, which is stimulated by the continuance of a fine stage of water, but operators, generally, complain that they are making no money. The coke trade is in a very unsatisfactory condition in consequence of the depression in pig iron.

The Pittsburgh *Commercial* of April 25th says: We can notice no material change in the market for Pig Iron since our last report, the sales being still confined to very small lots which were required for immediate use, or offered at a price below the actual cost of production, and less than that at which most of the standard brands are held. It is well known that the stocks in hands of consumers are not large, and that they must buy more or less iron very soon, or stop operations, but in face of this fact, there are some producers who press their iron on the market, even at the low prices quoted below. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

300 tons gray forge..... $27·00—4 mos.
200 tons gray forge..... 27·00—cash.
100 tons gray forge, neutral..... 27·00—4 mos.
100 tons gray forge, neutral..... 26·00—cash.
50 tons No. 1 foundry..... 30·00—4 mos.
50 tons white and mottled..... 24·00—cash.
50 tons No. 1 foundry..... 35·00—4 mos.
40 tons white and mottled..... 25·00—cash.
30 tons No. 1 foundry..... 30·00—4 mos.
10 tons No. 3 foundry..... 29·00—4 mos.
10 tons No. 1 foundry..... 30·00—cash.

CONNELLSVILLE COKE.

300 tons gray forge..... $27·50—4 mos.
200 tons gray forge..... 26·50—cash.
200 tons gray forge..... 27·50—4 mos.
150 tons gray forge..... 27·00—cash.
100 tons gray forge..... 28·00—4 mos.
30 tons foundry..... 28·00—4 mos.

ALLEGHENY COKE.

800 tons gray forge..... private terms.

ANTHRACITE.

100 tons gray forge..... $28·00—3 mos.
30 tons No. 2 red short, at furnace..... 27·00—cash.

HANGING ROCK CHARCOAL.

45 tons No. 1 foundry..... $38·00 @ 40·00—4 mos.

COKE FOUNDRY.

10 tons cold blast..... $52·00—4 mos.

CINCINNATI.

Messrs. ADDY, HULL & Co., under date of April 27, write us as follows: There has been some improvement in demand for Foundry Irons during the past week. Mill grades are moving very slowly, and quotations are to some extent nominal. Best Car Wheel brands are in limited demand at prices somewhat below present quotations.

HOT BLAST CHARCOAL.

Hanging Rock No. 1..₱ ton..$36·00 @ 38·00—4 mos.
" " No. 2..... 33·00 @ 37·00—4 mos.
" " Forge..... 30·00 @ 32·00—4 mos.
Tennessee No. 1..... 33·00 @ 36·00—4 mos.
" Forge..... 30·00 @ 32·00—4 mos.
Alabama No. 1..... 34·00 @ 36·00—4 mos.
Missouri No. 1..... 38·00 @ 39·00—4 mos.
" No. 2..... 35·00 @ 36·00—4 mos.

HOT BLAST STONE COAL.

Missouri No. 1..... ₱ ton..$35·00 @ 37·00—4 mos.
" Forge..... 30·00 @ 31·00—4 mos
Ohio No. 1..... 33·00 @ 36·00—4 mos.
" Forge..... 30·00 @ 31·00—4 mos.
Scotch Pig, No. 1..... " "

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel ₱ tn.$55·00 @ 60·00—4 mos.
Missouri " " ..... 55·00 @ 57·00—4 mos.
Kentucky " " ..... 55·00 @ 57·00—4 mos.
Tennessee " " ..... 55·00 @ 57·00—4 mos.
Georgia " " ..... 55·00 @ 57·00—4 mos.
Alabama " " ..... 55·00 @ 57·00—4 mos.
Machinery and Forge..... 55·00 @ 57·00—4 mos
Blooms..... 100·00 @110·00—4 mos.

BOSTON.

BOSTON, April 25, 1874.—There is no improvement in the market for Pig Iron. The demand is light, and the transactions are confined to small lots only. Prices are somewhat unsettled, and rule decidedly in buyers' favor. Refined Bar is dull, and without material change. We hear of sales out of first hands in round lots as low as $67, for common sizes, but jobbing sales are made at our quotations. We quote yard lots of American Pig Iron at $36 to $41 per ton, including No. 2 extra at $36 to $38, and No. 1 at $39 to $41. We quote Eglinton at $40 @ $42, Coltness, at $43 to $45, Charcoal at $50 to $60. American and English Refined Bar Iron is selling at $70 to $80 per ton for the ordinary sizes, and $85 to $90 for extra sizes, according to size. Cast Steel is selling at 16c., gold, for English, 18c., currency, and 15c. to 15½c. for American, currency, with fancy brands of English selling at 17c., gold. Anchors are selling at 8½c. per lb.; Chain Cables (⅝ to 2 inches thick), 7c. to 8¾c. per lb.; Coil Chains, 7½c. to 16c. from 3-16 to 1¼ inches. We quote Boiler Plates at 6½c. to 7½c. for Flanges, 4¾c. to 5c. for C No. 1, and 4½c. to 4¾c. per lb. for Common and Tank. Russia Sheet is selling at 18c., gold, and 20c., currency, for perfect lots. English and American do. are selling at 6¾c. to 8½c. per lb. currency. We quote Galvanized Sheet Iron, No. 20, at 11c.; Nos. 21 to 24, 12c.; 25 and 26, 13c.; 27, 14c.; 28, 15c. Nails are selling at $4·25 for 10d to 60d, and other sizes at a range of $4·50 to $8·25 per 100 lbs., less discount of 15c. per keg to the trade on 100 keg lots. Horse Nails, 28c. for No. 7.—*Commercial Bulletin.*

LOUISVILLE.

Mr. GEO. H. HULL, under date of April 27, writes us as follows: The market is quiet but steady. There is no immediate prospect of the mills resuming work, and Forge Irons are not salable at quotations. Foundry and Car Wheel Irons are in moderate request to supply immediate wants. The usual time, 4 mos., is allowed on the quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores..$38·00 @ 40·00
" 2 " " " " .. 34·00 @ 36·00
" 1 Forge, " " " .. 31·00 @ 32·00
" 1 F'dry, from Tennessee Ores..... 35·00 @ 40·00
" 2 " " ..... 33·00 @ 35·00
" 1 Forge, " " ..... 30·00 @ 31·00
" 1 F'dry, from Alabama Ores. ..... 35·00 @ 38·00
" 1 " " Iron Mountain Ores. 41·00 @ 43·00

HOT BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores..... 34·00 @ 36·00
" 2 " " " .. 32·00 @ 33·00
" 1 Forge, " " " .. 30·00 @ 31·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores.. 60·00 @ 63·00
" " Tennessee Ores..... 53·00 @ 55·00
" " Alabama Ores..... 55·00 @ 57·00
" " Georgia Ores..... 55·00 @ 57·00
" " Missouri Ores..... 53·00 @ 57·00
" " Kentucky ..... 55·00 @ 57·00

ST. LOUIS.

Messrs. GARRETT, MCDOWELL & Co., under date of April 25th, send us the following: No alteration has occurred in the general position of Pig Iron in this market since our last report. Consumers are not disposed to increase their holdings, and generally buy as their necessities require. Sales, therefore, have not been large during the week, but prices have been regular for usual size purchases. We quote:

HOT BLAST STONE COAL

No. 1 Foundry, from Iron Mountain and Maramec Ores..... .....$33·00 @ 34·00
No. 2 Foundry, from Iron Mountain and Maramec Ores..... 31·00 @ 32·00
No. 1 Forge, from Iron Mountain and Maramec Ores..... 28·00 @ 29·00
No. 1 Foundry, Massillon, O..... 42·00 @ "
No. 1 " Ohio Cold Short..... 38·00 @
No. 1 " Tennessee Cold Short 34·00 @ 35·00

HOT BLAST CHARCOAL.

No. 1 Foundry, from Iron Mountain and Maramec ores..... 36·00 @ 42·00
No. 2 Foundry, from Iron Mountain and Maramec Ores ..... 32·00 @ 40·00
No. 1 Foundry, from Tennessee ores .. 35·00 @ 37·00
No. 1 Forge, " " ... 31·00 @ 33·00

COLD BLAST CHARCOAL.

Car Wheel, from Hanging Rock Ores.. 57·00 @ 60·00
" " Tennessee or Alabama Ores..... ..... 55·00 @ 58·00

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of April 28, 1874: We note a slight improvement in trade for the past week, with some South and Southwestern buyers in the market, though the orders placed are small and issued with much caution, and only to relieve pressing and present wants. We quote the list as unchanged and firm.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick.. } 3 to 3 1-10c per lb.
1 to 4¾ wide by 1½ to 2 thick }
Round and square, ordinary sizes, from ¾ to 2 inclusive .....3 to 3 1-10c. "
Hoop Iron, 1½ wide and upward..4¾ to 5c. per lb.
Band Iron, from 1¼ to 4 in. wide..4 to 4¼c. "
Horse Shoe Iron ¾ to 1 wide by ⅜ to ½ thick..... 4¾ to 5c. "
Norway Nail Rods.....7¾ to 8¾c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes.....16¾c. "
Machinery Steel.....11¾c. "
Cast Spring Steel.....11c. "
Homogeneous Steel Plate..... 13c. "
Perkins' Horse Shoes, per keg of 100 lbs.....$5·87½
" Mule Shoes " " ..... 6·87½
Common Horse Nails, from 14c. to 18c per pound.

	10	9	8	7	6	
Putnam Horse Nails..	23	24	25	26	28c.	per lb.
	10	9	8	7	6	
Globe Horse Nails..	23	24	25	26	28c.	per lb

R. R. Spikes.....5¾ by 9-16 at 3¾c. to 4c. per lb.

FOREIGN.

GREAT BRITAIN.

Messrs. J. Berger Spence & Co., London, Glasgow and Manchester, under date of April 11, 1874, report:

Metals.—There has not during the week been any alleviation of the depression that for the past month has permeated our metal trade, and prices still recede without proving provocative of any extension of business, and the iron trade masters now seem determined to reduce their make rather than attempt the apparent impossibility of reconciling the conflicting demands of labor on the one side and of their customers for a cheap article on the other. Scotch Pig Iron Warrants have receded during the week, and Makers' Iron is not in much demand. The shipments for the past week are returned as 10,238 tons, against 15,276 tons in the corresponding week of last year. Smelters are still averse to accept present rates for Middlesborough Pig Iron. The quarterly meetings of the trade for manufactured and other Irons have been held in Middlesborough and South Staffordshire during the week, and have presented a striking contrast to the state of affairs which existed at this time last year. Then it was exceedingly difficult for consumers to place their orders at any reasonable rate; now the conditions are reversed, and little or no transactions are reported, except in Foreign Iron, which is freely offered, and competing successfully with our native production, even in the Black County itself. Copper does not improve in value. Another reduction has been made in the price of English Tin, and Straits is lower. There are tokens of weakness in Lead, but not much alteration in smelters' quotations. Spelter is dull.

IRON—"Ayresome" Yorkshire Pig Iron, prices nominal, No. 1, ——; No. 2, —— ; No. 3, ——; No. 4 (Foundry), ——; No. 4 (Forge), ——, net cash, or 2/ extra 4 months' bills. Scotch Pig warrants, 75/ to 77/6. Staffordshire Bars, £11/ to £12. Hoop Iron, £12 to £13. Gas Tubes, 60 per cent. off list. Boiler Tubes, 37½ per cent. discount.

COPPER.—English Tough Ingot, £83 to £85. Chili Bars, £74 to £76.

TIN—English Ingot, nominal, £90 to £91. Straits, £86 to £88.

TIN PLATES.—Best Coke, I. C., nominal, 28/ to 30/; Charcoal, I. C., 36/ to 40/ per box.

LEAD.—Best English Soft Pig, £21 to £22/. Refined Red Lead, £24 to £25.

ANTIMONY.—French Star, £53 to £54.

SPELTER.—Silesian, £21. 15/ to £22. English, £22 to £23.

FRANCE.

(Le Moniteur des Interets Materiels).

PARIS, April 12, 1874.—*Metals.*—Through the intervention of the holidays the Metal business in Europe, from being quiet before, has now become utterly stagnant. There has been no great change in values, owing to the temporary absence of speculators from the markets. *Copper.*—As regards this metal, weakness is the predominent feature; on passing under review the leading copper centers, it will be found that speculators in the article have been very much discouraged, and that consumption also is keeping aloof. The downward course of Copper, uninterrupted as it has been, has disconcerted consumers, who evidently are doubtful as to whether bottom has been touched or not, and consequently hesitate about laying in the usual spring supply. Yet, stocks in Europe are lighter than they were last year toward the middle of April, when Chili Copper commanded between £92 and £93 in England, now down to £74 and £75. The rejoinder will be made that stocks on the Chilian coast are large, and that the heavy charters made at Valparaiso have, with good reason, weighed down prices in Europe. Without wishing to contest the correctness of these facts, we beg to remark that the general dullness in the metal trade has also been one of the main causes of depression. It will be useless, therefore, to look for a better market in Copper till the general situation assumes a more cheerful aspect. What we have said on various occasions about Iron and Coal is equally applicable to the metal markets. The Franco-German war, and the period which followed that event, had created unlooked-for requirements, and when these had been attended to, a situation arose which rested on a false basis; the extraordinary activity that had prevailed led our great Continental manufacturers into the mistaken notion that it would be boundless. We therefore insist that we shall have no sound foundation to rest upon till prices are brought back to what they were ere the war began, and the situation will then be all the surer to inspire confidence, if we can see it restored among us without a violent crash with its failures. Reflections of this kind are suggested to us more by the article Copper than by any other, the decline in Chili Bars having been something like £10 per ton during the first quarter under review. In England, the week has been quiet, but since the 10th instant there is a decidedly better feeling at London; Chili Bars, good ordinary brands, are £74. 10/ to £75; best brands £77 to £79; tough cake and ingots, £83 to £84; Best Selected ingots, £85 to £86; Burra Burra Cake, £84/10; Wallaroo Cake, £85. 10/. Yellow Metal, 8d. per lb. Paris is still on the decline with Copper, and we are 5 francs lower; Chili Bars deliverable at Havre are 197½ francs; Ingots, 212½; Corocoro Ore, 203¾. Havre, first brands Chili, 202½ to 205; current do., 200; Lota and Urmeneta, 196¾ to 197½, the 100 kilos. Marseilles is quiet and unaltered. German is paralyzed. *Tin.*—What we have said with reference to Copper may be put down as equally applicable to the remaining metals, Tin, Lead and Spelter, for they have all, without an exception, been submitted to the evil influences of importation in the trade. Banca at London is £90 to £91, nominally; Straits, cash, £87; three months prompt, £36. English in slabs and ingots, £89; in barrels, £90 to £91; refined, £91. A fresh decline here, at Paris, Banca deliverable at Havre or here 243; Straits 238; English at Havre, 235. Marseilles is still drooping; purchasers are discouraged, and prefer to abstain altogether; Straits down to 240. At Rotterdam a better feeling is reported; both operators and the trade buy extensively, the former for the covering of futures. In Germany weakness still prevails; the dealings are light, and prices, from their insignificance, have not varied. *Lead.*—But a very limited business is doing in it in England. English Pig is quoted £20. 15/ to £21. 10/; W. B., £24, nominally; Spanish and German, soft and without silver, £20. 10/ to £20. 15/. Paris and Havre are 53 francs for French and English. Marseilles is weak at the moderate figure of 53. *Spelter* is as much neglected as the rest, and at London not a transaction has transpired during the week. Silesian, spot, £21. 10/ to £22. 5/, according to brand; English, soft, V. & S., London or Havre, £22. 10/. Paris is lower by a franc or a franc and a half, according to brand, the price being 57 francs. Marseilles is on the downward track, too. Germany nominal, and without dealings. *Iron.*—There is no real amelioration to be reported, and, despite the spring season, usually a favorable one, notwithstanding the favor with which the projected public works are looked upon, the recovery is a slow one, and dealings are of little magnitude; but we have at length reached a point where a further decline seems to have been arrested, 220 to 230 francs in the Haute-Marne and at the North for Wrought Iron; Pig neglected at 75. The center and South of France bear up better than Paris and the North. Ferro Manganese and phosphorous Steel still form the main subject of concession in Iron circles in the Republic. A company with 6,000,000 francs capital has been formed for the purpose of working on the new manganese plan. A multitude of new inventions in the Iron and Steel branches have been brought to light. With cheaper raw material at the disposal of inventors these innovations are introduced under encouraging auspices. Iron industry should follow the law of progress more actively than ever before, and those who do not follow in the wake have none but themselves to blame. *Coal.*—The main topics of conversation among our Coal men have been the English strikes, and the influence which they may exercise upon prices there, as well as on the Continent. Till now they have influenced the general tone of the markets in a manner hardly perceptible, nor do we expect they will in the future, at all events not for any length of time. Coal companies are every where compelled to cut down wages by the necessities of the case, the great decline in values. Belgium reduced them long ago, and in our northern Coal districts the example has been followed without delay. In the Pas-de-Calais mines the reduction of wages has been 33 per cent., and the average cutting down in France may be set down as 20 per cent. Coal is sold below official price list, but not unless the quantities be of a certain importance. Consumption at Paris, at this season, diminishes.

BELGIUM.

(Le Commerce.)

BRUSSELS, April 11, 1874.—*Iron.*—The market is still deplorably quiet, but some auspicious circumstances renders the situation less unfavorable than was the case a fortnight ago. While, on the one hand, large orders cannot be obtained, and the future is still uncertain, there is on the other not an absolute dearth of work, thanks to a pretty considerable number of smaller current commands keeping our establishments in full swing. Then we have England favoring us with a goodly share of Iron, beam plate and rail orders, particularly since the spectre "strikes" has once more begun to stalk about in the British Isles, the more so as in reality we are a great deal lower in price than what they are on the other side of the Channel. The prospects are that these English orders will continue for some indefinite time, for the chances are that Belgium will long remain below parity with England. At Liege, particularly, there is a decided revival. A rolling mill that had suspended work since the crisis began, will rekindle its fires by the end of the current month. The present time seems to invite contracts. Raw material has declined to a reasonably low level, Coal and Pig Iron are neglected even at the reduced ruling, and the first vigorous rebound would send up prices high enough to largely remunerate those who had the good sense and courage to lay in supplies while rates were cheap. On the 20th instant the "Industrial Exchange" will open at Liege, founded by our leading miners and manufacturers, whose interests center in the locality, and will, no doubt, facilitate the transaction of business in a most useful manner. While stock jobbing and merchandise exchanges abound all over Europe, strange to say industrial ones are scarce, and this anomaly is with difficulty explained, the interests at stake being fully as large as in the other two branches, in which the exchanges fast degenerate into gambling shops in "futures," which would not be the case in an industrial exchange, except, perhaps, so far as Coal, Iron and metals were concerned. Here, at Brussels, an Iron and Coal exchange is to be installed in the new building. *Coal.*—Confusion still reigns supreme in the Belgian markets; prices remain irregular. At Liege production has been reduced one-half, the companies that have any stock on hand, make sacrifices to get rid of it, and large purchases are made on private terms from them, at rates much below the officially current ones. At Charleroi, despite the demand for sugar refineries and large purchases effected of lean Coal, prices have not improved, and sales are made to some extent below official tariff rates. Nothing new at Mons.

HOLLAND.

Evers & Co.

ROTTERDAM, April 11, 1874.—*Tin*—Banca, prompt, sold at 52½ and 53¾ guilders the 50 kilos; delivery from May auction at 52, 51¾, 52½; from the July sale, at 52 and 51¾. Billiton, spot, brought 50¾, and steam afloat, 51.

EAST INDIES.

(Aitken, Spence & Co.)

COLOMBO, March 18, 1874.—*Plumbago.*—We have still nothing new to report. Considerable quantities continue to go forward to the London market on native account, and the rate of freight is thereby maintained at 70/, against 40/ per ton same time last year. Total exports from Oct. 1, 1873 to date are 4054 tons against 3410 in 1872 and 1873. These 4054 tons, representing 81,073 cwts., have been distributed as follows: To the United Kingdom, 60,902 cwts.; to the United States (Atlantic), 19,956, and to Australia, 215. The *Minerva* sailed on 2d instant for New York with 1889 cwt. Plumbago. The schooner *Lile* has been chartered with option of New York; terms not transpired. Freights from 67/6 (6th instant), have risen to 70/. Exchange tending upward, credits 2/.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., April 13, 1874.

GENERAL STATE OF TRADE.

Despite the fact that the quarterly meetings of iron masters have been held both at Wolverhampton and Birmingham since the date of my last letter, I am still unable to announce a general, or, at any rate, an official drop in the price of finished iron. It is true that one important firm (G. B. Thorneycroft & Co.) have declared bars down £2 per ton, making the current price £12; yet, up to the time of writing, I fail to learn that their example has been followed in any one instance. Other particulars of the quarterly meeting will be found detailed hereunder. As a whole, the British iron trade is growing worse week by week, and it is fully apparent, even to the most superficial observer of current events in connection with it, that unless an influx of orders can be secured by lower quotations almost immediately, a still more serious aspect of the case will be presented. The *Economist* believes that the cause of the current depression is the excessively high prices, and thinks that, "instead of wondering at the collapse in the iron and coal trades, which is now manifest, and the generally prevalent depression, we ought, perhaps, to wonder at the effects we now perceive having been delayed so long." In the face of these sapient remarks, I shall say no more at present, but seek "fresh fields and pastures new" in

THE BOARD OF TRADE RETURNS

for the month of March, which have just been issued. The total value of the exportations from Great Britain during that month was £20,100,814 as compared with £21,744,218 in March, 1873, a decline of about 7½ per cent., although when compared with March, 1872, the fall is ¼ per cent. only. In coal and patent fuel there is an advance of 15½ per cent., although the recent fall in prices has made the increased value 2½ per cent. only. The shipments of iron and steel fell off 22 per cent. in quantity and 16½ per cent. in value; hardware fell off 15 per cent., and machinery 9½ per cent. Telegraphic wire, on the other hand, shows an increase of not less than 48½ per cent., and chemicals advanced 18 per cent. Railroad iron also shows considerable increase over the total of March, 1873. The following figures speak for themselves:

HARDWARE AND CUTLERY.

To	Month ending 31st March, 1873.	Month ending 31st March, 1874.	Three months ending 31st March, 1873.	Three months ending 31st March, 1874.
Russia	5,640	2,523	17,493	11,166
Germany	30,242	20,872	60,859	64,568
Holland	10,669	8,674	24,604	23,779
France	14,672	12,198	37,479	30,978
Spain and Canaries	8,133	8,319	24,160	24,412
United States	77,201	65,233	227,906	179,483
Spanish West India Islands	10,017	5,034	35,183	10,787
Brazil	23,324	21,966	75,022	64,487
Argentine Republic	12,577	7,305	46,013	31,457
British N'th America	6,851	9,353	8,467	11,859
British India	16,186	21,819	52,473	74,549
Australia	52,687	44,786	143,177	133,489
Other countries	133,188	113,887	393,762	330,100
Total	401,387	341,970	1,166,498	991,125

IRON AND STEEL.

	Q'tity. Three months ended March 31, 1873. Tons.	Value. Three months ended March 31, 1873. £	Q'tity. Three months ended March 31, 1874. Tons.	Value. Three months ended March 31, 1874. £
Pig iron	281,961	1,750,834	141,768	815,245
Bar, angle bolt and rod	69,781	873,653	54,064	707,478
Railroad	134,515	1,776,314	159,303	2,133,514
Iron and steel wire	7,917	178,225	6,707	153,599
Hoops, sheets, and boiler and armor plates	50,439	878,925	31,736	608,424
Tin plates	34,737	1,147,166	34,872	1,072,636
Cast or wrought	58,620	1,135,439	52,920	1,096,491
Old, for manufacture	19,585	127,837	3,924	26,739
Unwrought steel	9,281	336,591	6,446	258,031
Steel or steel and iron combined	2,727	170,967	1,843	149,188
Total	669,563	8,375,951	493,583	7,021,345

There was a great decrease in unwrought copper, but a large increase in wrought copper and brass. In the first named, the decline was 13,114 cwts. in quantity and 68,622 in value, but for the three months the falling off was 37,336 cwts. and £184,993, quantity and value respectively. The United States took nothing last month as against 12,874 cwts. in March, 1873, and the exports to France also fell off 52 per cent. The chief increase in the item of wrought copper was with British India.

The decline in hoops and sheets is very notable, being 7626 tons, value £121,280, in the month, and 18,703 tons, value £270,501, in the quarter. This marked diminution is wholly owing to the defection of the demand from the United States, Russia, Germany and Australia. In railroad iron, too, the trade with the States and Belgium fell off, but it increased largely with India, Brazil, Sweden and Australia. These are, I take it, somewhat instructive figures, and are worth several bushels of argument in any one or other direction.

THE BESSEMER MEDAL.

The conditions upon which the Bessemer medal will be awarded by the Council of the Iron and Steel Institute, at their next meeting (to be held in London on May 6th, 7th and 8th, 1874), are these:

"The Bessemer Medal will be awarded at each of the annual meetings of the Institute, unless the Council desire to suspend such award until the next annual meeting, in which case the medals for this and the previous year may be both awarded. The Council may award the medal either to members or non-members of the Institute. (1). The awards are to be to the inventor or introducer of any important or remarkable invention, either in the mechanical or chemical processes employed in the manufacture of iron or steel. (2). For a paper read before the Institute, and having special merit and importance in connection with the iron and steel manufacture. (3). For a contribution to the *Journal* of the Institute, being an original investigation bearing on the iron and steel manufacture, and which has been or may be productive of valuable practical results. (4). The Council shall, in their discretion, award the medal in any case not coming strictly under the foregoing definitions, should they consider that the iron or steel trades have or may be substantially benefited by the person to whom such award is made. The Council have resolved that the medal shall not be awarded to one of their number."

THE STRIKES

are still—thank a benign Providence!—progressing, and if the existing form of constitutional government be steadily maintained, one can hardly detect any particular reason why the whole nation should not go "out on strike" and allow some of the less favored races of the

earth to provide us with the wherewithal for our physical wants, as some slight return for the many "blessings of civilization," and so-forth, which have emanated from us during the last few centuries. In the meantime—pending such arrangement—I may remark that the Scotch coal and ironmasters have decided to give their men notice of a *further* fall in wages, in addition to the drop of 20 per cent. just assented to; that at an iron trade conference held at York on Friday, it was resolved to reduce the wages of puddlers 1/, and of forgemen and millmen 10 per cent. per ton throughout the country from April 4th to July 4th next (a proposal not yet agreed to by the men); that 3000 colliers in Somersetshire have struck, and that many other disputes are pending. Whilst on this subject I may mention—as a matter of much interest—that at the

QUARTERLY MEETING OF THE TIN PLATE TRADE,

held in Liverpool last week, it was stated that there are now 13 lockouts in the trade in South Wales, and that on Saturday next 24 firms in Glamorganshire and 12 in Carmarthenshire will also lock out their men, making over 10,000 out. In order to render the step effectual the Staffordshire and Monmouthshire masters have agreed not to find the locked out men any work. At the dinner in the evening General Fairchild, American Consul, Mr. Guion, Mr. Clint and others were present, and it incidentally transpired that the estimated yearly production of tin plates is 3,000,000 boxes, of which 2,100,000 are exported, about 1,500,000 being shipped from the port of Liverpool alone. Prices were not changed in either direction. It is, perhaps, worth mention, that at the dinner (to which some 120 gentlemen were invited by Messrs. Henry Nash & Co., one of the oldest firms in the trade at Liverpool), the *menu* was printed on pieces of tin plate, in a style which was really as artistic as it was admittedly ingenious! When the armor plate makers dine together I suppose they will have their "bill of fare" printed in the most approved fashion on handy pieces of 18-inch plates! This, however, merely by way of preparation for the consideration of the

STATE OF THE SCOTCH IRON TRADE.

The iron trade of Northern Britain is at present in a very peculiar condition. There are only 36,000 tons of iron in Connall's stores; there are fully half the furnaces in Scotland blown out or damped down; all the miners have been on strike for a time, yet business is quite disorganized, and prices have not ceased going down. In all probability the ironmasters will seek to put wages down still more, in fact at Shotts the men have just been served with notice of a reduction of 40 per cent. The warrant market has been very irregular (probably owing to the failures to which I shall presently allude), and prices have fluctuated considerably. At present g. m. b. warrants are held at about 74/ to 76/, and makers' figures, although exceedingly irregular, average the following:

	No. 1.	No. 3.
G. m. b., at Glasgow (deliver. alongside	74/	72/
Gartsherrie, " "	84/	76/
Coltness, " "	90/	76/
Summerlee, " "	85/	76/
Carnbroe, " "	81/	76/
Monkland, " "	—/	—
Clyde, " "	—/	—
Govan, at Broomielaw, "	76/	74/
Langloan, at Port Dundas, "	86/	—
Calder, " "	88/	77/
Glengarnock, at Ardrossan, "	84/	78/
Eglinton, " "	78/	77/
Dalmellington, " "	—/	—
Carron, at Grangemt'h, selct'd "	85/	—
Shotts, at Leith, "	85/	79/
Kinneil, at Bo'ness, "	—/	—

	Tons.
Shipments.—Week ending 5th April, 1873	15,276
" " 4th April, 1874	10,238
Decrease	5,038
Total decrease since 25th December, 1873	46,589

In some cases there is considerable delay in getting consignments alongside. At Blochairn Iron Works, last week, I may here remark, there was rolled the largest plate ever yet made in Scotland from a single pile. Its dimensions are 23 feet 6 inches in length by 4 feet in width and 1 inch in thickness. The weight of the pile going into the furnace was 4400 lbs., or nearly two tons. The failures which have done much to disorganize the Glasgow market are those of Messrs. Hannay & Son, whose liabilities are £393,000, with assets worth £213,000, and Messrs. Watson & Campbell, whose liabilities are £324,475, and assets £58,398. The Blochairn Iron Company also held a private meeting in Glasgow on Friday, and decided to both increase the preferential shares, and to make a call of £10 per share on the ordinary stock. The examination of M. Colin Campbell, the sole partner in the firm of Watson & Campbell, elicited several facts of interest. For instance, it was stated that he began business in 1862, in copartnership with Mr. James Watson, who retired in December, 1870, leaving Campbell to carry on business with a capital of £4000. On December 31, 1873, his balance showed his capital to be £51,000, and he appears to have been so well satisfied with the figures that he has since made no balance. From that time he owned he had speculated largely in pig iron, shares, stocks and copper. His losses in shares and stocks since then had been £162,000, and in pig iron and copper £20,000. Altogether his deficit amounts to the tidy little total of £266,077. In one case he had sold 6000 Canadas and had bought 800 to 1000 Shoots, 1800 Tharsis (copper) and £5000 North British. Hence, I think we may exclaim "*Hinc illae lachrymae!*" Some day or other—I have remarked so in your columns on many occasions—we shall learn more of the desperate speculation which prevails in Glasgow; and yet our press turns up its virtuous nose at your Well street.

TRADE OF MIDDLESBORO'.

The Middleboro (Cleveland) quarterly meeting does not call for extended notice. A feeling that things were at the worst was freely expressed, and hopes were given ventilation that as soon as the wages question was disposed of a firm basis would be secured whereon to build up a good summer trade. Prices are: Rails, £9 to £10; Plates, £11 to £12, and Puddled Bars, £6. 5/ to £6. 7/6., with little doing.

SHEFFIELD.

The majority of the iron, steel and other establishments of this town and district have been closed from Thursday afternoon last up to Wednesday morning, owing to the Easter holidays. On Monday and Tuesday a veritable host of miners and ironworkers invaded the town in order to witness what is termed a "great handicap," whereat in all probability the sporting propensities of the 20,000 or so who are reported to have been present each day, would doubtless cause the loss of no small amount of their goodly wages. Not only is the town thronged and filled to repletion on these occasions, but betting on the most extensive scale is openly carried on in public thoroughfares and in numerous public houses. The police appear powerless; yet there can be no doubt whatever that these occurences are of a most demoralizing nature, and in busy times lead to an immense amount of loss and inconvenience to the coal and ironmasters, seeing that the men will leave work, no matter what may be in hand at the time.

Transactions, as will thus be inferred, have been on a most limited scale. Pig iron is weaker all round in sympathy with the Scotch and Middlesbrough markets. A fair quantity of North Lincolnshire ironstone and pig is being brought into this locality, the price being stated at about £3. 5/ for forge iron. Hematite pigs are not in great request, but, together with British ores, are somewhat easier in price.

Common steel is not sought after, consequently the few orders for respectable quantities have been recently executed at a drop of from £2 to £3 per ton.

Coal is accumulating on the pit banks in all directions, and that, too, in spite of the interruption to business caused by the Easter holidays. One of the principal firms of this locality—the Sheffield Coal Company—on Wednesday morning sent out a circular to its customers fixing quotations as under: Picked branch coal, 15/6; best Birley Silkstone, 13/; screened Silkstone nuts, 10/6; screened seconds coal, 10/6; breeze coke, 11/; and hard melting coke, washed, 28/, all per ton of 21 cwt. at the pit's mouth. At Barnsley soft coal can be bought at 11/ to 12/ per ton, the carriage to London being in all about 9/9 per ton, yet the selling price in the metropolis is about 28/ to 29/ per ton, showing that the merchants are still having the "best pull" of all concerned. There have also been reductions in price in the Rotherham and other districts, varying from 1/ to 3/ per ton.

There is no real movement in cutlery, albeit a few good American orders for best razors and table knives are being worked out. The prices of these goods have, I understand, been advanced 7½ to 10 per cent., but the rise is likely to be confined to the commoner kinds. There is a fair inquiry for the best makes of files, rasps and special cutlery (shoe, butchers', etc., knives), but, as a whole, trade in the cutlery branches here has hardly been so dull for a dozen years. Some interest is shown in the fact that the miners of various districts appear desirous of ascertaining for themselves, in a precise and practical manner, what the profits of colliery working really are. The Monkwood Colliery, a tolerably extensive undertaking, situate between Sheepbridge and Barlow, in North Derbyshire, a few miles from Sheffield, has this week been transferred from Mr. Pleyins, its former proprietor, to an association which has the title of the "Coal Co-operative Company," with offices situate at Millbank, London. This company is composed of the miners' associations of several districts—Durham, Yorkshire, Northumberland, &c.—and the managing committee includes their chief officers, Messrs. Normansell, Casey, Dixon and others. I am not aware what the exact weekly output of the pit is—probably seven or eight hundred tons—but it has been taken in full working order, with its coke ovens, &c., also in operation. A meeting of the committee was held at the Angel Hotel, Chesterfield, on Thursday last, and on the following day the miners and others employed in the pit were assembled, informed of the change in the proprietary, and requested to become interested therein themselves. The purchase was, it is understood, just in time to prevent a strike in case the proposed reduction of wages had been insisted upon. Mr. McDonald, M. P., strongly urges the men to do this in all districts, in order to do away with disputes, and pocket what profits may accrue.

BIRMINGHAM AND WOLVERHAMPTON.

At the Birmingham quarterly meeting there was a large attendance, but the actual transactions were on an exceedingly limited scale. The only declaration of lower prices was that of Messrs. Thorneycroft, who reduced bars by £2, making their quotation £12. The Earl of Dudley, Messrs. Barrow, and other firms, are understood to be willing to make a similar reduction as soon as the wages question is disposed of. Some few of the Staffordshire firms reduced pig iron 10/ to £1 per ton, which will probably enable the "middle" men to put down finished iron in a corresponding degree. The quarterly meeting of the day previous, at Wolverhampton, was not widely different, and did not produce any dissimilar results. The Birmingham *News* has the following on the subject generally:

"The quarterly meetings of the iron trade at Wolverhampton on Wednesday, and at Birmingham yesterday, have been singularly barren of result, both in regard to the extent of the business transacted, and the modification of the serious difficulties by which the industry is hampered on all sides. The "situation" is simply one of anxious suspense, and, as Mr. Brogden has well observed, nothing is more prejudicial to trade than apprehension and uncertainty. Buyers and makers are equally aware that the standard of prices is too high to restore a tone of health and confidence to the trade, but they are alike unable to say how soon the adverse conditions by which these inflated prices are kept up may be removed. The result is a fear on both sides to commit themselves to important engagements. As predicted in our report of the Wolverhampton meeting, nothing was done by the Earl of Dudley and Messrs. Barrows—whose quotations are supposed to rule the trade—in the revision of prices. With the stoppage of fuel supplies, and the very uncertain prospects of the trade generally, it is not surprising that these houses decline to anticipate events, the shadows of which are, as yet, but faintly cast before them. In such parts of the district as are less affected by the miners' strike than Round Oak and Bloomfield, the iron masters are freer to act in regard to prices, and no one was surprised when it became known in the Town Hall, yesterday, that the firm of G. B. Thorneycroft & Co., Wolverhampton, had reduced the standard of finished iron by £2 per ton, or to the basis of £12 for marked bars. This action on the part of Messrs. Thorneycroft is only a formal announcement of what has for some time been a well known fact, that good brands of Staffordshire bars were obtainable at £2 per ton below the nominal quotation, and it is no secret that common unmarked bars of Staffordshire make can be bought for as low a sum as £11 per ton. That iron can be made with profit at such a figure under present conditions of production is very doubtful; but the fact remains that it is being offered at that price, and a still more important fact is that the quotation, low as it is, will not tempt orders. Seldom has the iron trade of South Staffordshire been so inanimate as during the last few weeks. Of its full complement of 160 blast furnaces, only 70 are now alight; and this minority will, to all appearance, speedily be decreased in number. The mills and forges, even where fuel supplies are available, have the prospect when the holidays are over of barely half-time operation. No doubt much of the stagnation in demand is due to the commercial depression in America, which market is usually a good customer for Staffordshire iron; but the chief secret of the gloomy state of affairs now prevailing is simply that our prices are too high, and that foreign rivals are successfully competing with us at our very doors. It is the opinion of experienced members of the trade that nothing less than a reduction of marked bars to £10 per ton, and proportionate rates for other classes of finished iron, will meet the exigencies of the present crisis. If this be correct, the sooner the fact is acknowledged the better for all concerned. A considerable cheapening of production in all directions seems to be the only remedy for the serious dilemma into which the iron trade has been plunged. This can only be brought about by the co-operation of the coalmasters, who are still clinging with vain hope to the delusion that by obstinate refusal to yield to the inevitable, they can reverse the axiom in political economy so sternly put in the couplet of *Hudibras*—

"The value of a thing
Is just as much as it will bring."

A speedy and substantial reduction in the price of fuel, and a prompt and amicable adjustment of the grave disputes which are agitating the labor market appear to us to be the only means of averting from the iron trade of South Staffordshire another of these terrible episodes which bring in their train such widespread ruin, suffering, and despair. Very severe already has been the strain upon weak houses, and a much longer continuance of the present condition of affairs will be fraught with consequences most serious and calamitous to all concerned."

This is exactly what I have urged in your columns many times recently. There is no material alteration in the general state of the hardware trades, beyond a reduction in tinned and enamelled cast iron hollow ware, which is brought about by advancing discounts 5 per cent. and reducing net prices by 7½ per cent.

SOUTH WALES.

Trade there remains quiet, not to say really dull. There have been light shipments of iron to the River Plate, West Coast of South America and Van Diemens Land, with a few rails to America. The Nantyglo and Blaina Company have given their men notice of 15 per cent. reduction. Unless accepted the works will be closed. At Cyrfarthfa another furnace will this week be blown out, throwing 300 more men idle, and just as I write intelligence is to hand stating that Mr. Crawshay has given notice to cease all contracts with the whole of his men, *in consequence of orders not being obtainable.* The works will not be reopened, except at a marked drop in wages. This is a most peculiar result of the late strike. Prior thereto Mr. Crawshay always kept Cyrfarthfa going, whether there was any profit or not. The old Iron King did it to keep his men employed. They were his subjects, in one sense, and, like a true king, he would not see them suffer. But now that the men have had the ingratitude to strike against him for higher wages when trade was brisk, he must needs take a purely commercial view of the matter by reducing wages when trade is dull. I doubt whether the changed state of things is anything to the advantage of the Cyrfarthfa men.

THE METAL TRADE

is fairly active. Messrs. Dadelzen & North say that copper continued quiet until yesterday, when a better demand sprung up, in consequence of a telegram from Sydney that all the men at the Moonta and Wallaroo mines had struck work. Chili bars, which were sold as low as £74, have recovered to £75, cash. Wallaroo changed hands, at £84, but yesterday as high as £85. 10/, cash, and £86. 10/, three months, was paid; price to-day, £86. Burra, £84 nominally. English is firmer. *Tin.*—Very little has been done except for immediate consumption, and mostly Australian, from £85 to £85. 10/. Straits is held from the market, and quite nominal, £88. Banca, in Holland, 52½ fl., spot. Billiton, 50 fl. to 50½ fl.; large quantities of this tin are offering, without finding buyers. English—common, £89 to £90; refined, £91 to £92. *Tin plates.*—The lock-out in South Wales is extending, and the question now is how long it will last; prices are steady but not animated. *Lead* shows no change, and in but slight demand; good soft English pig, £21; L. B, £21. 5/ to 21. 10/. *Spelter*, dull; nothing doing; Silesian, nominally, £21. 10/; English, £22. *Quicksilver*, £19. 15/ to £20.

Messrs. French & Smith's circular says: Although there is perhaps a better tone in the market, business continues very restricted. Iron is in a very unsettled condition; prices mostly nominal. *Copper* is rather firmer. *Tin.*—Straits is scarce, the demand (what there is) falling upon Billiton and Australian. *Tinplates*, owing to the lock-out, nearly at a standstill. *Lead* very dull. In other metals nothing to notice.

Messrs. Kelly's circular takes a gloomy view of the chemical and mineral market, and inclines to the belief that the latter is in a ruinous position. As to metals they say, in briefly summerizing the position:

Copper demand entirely for consumption, and that very little. Copper mining in Cornwall has collapsed. In the past quarter Cornwall and Devon have sold at the ticketing 13,045 tons of copper ore, containing 919 tons of fine copper, and fetched £52,879, equalling £4. 1/ per ton for ore and £57. 10/ the ton of copper in the ore. Other copper ores sold at Swansea, 7558 tons, containing 1230 tons fine copper, fetching £99,246, averaging £12. 10/ the ton of ores, and £80. 17/ the ton of copper in the ore, ore at ticketings 7 per cent., at Swansea 16¼ per cent. Chili probably will produce 10,000 tons yearly.

Messrs. Rogers & Son's price current thus reviews the metal trade of the month: *Copper.*—The reduction in price of this metal has been most disappointing to the trade generally. Its statistical position has improved month by month for the past year almost without intermission, at the same time the price has hardly ceased to recede, till we are now £17 per ton cheaper than twelve months since. The only cause that seems to be apparent for this change is the entire absence of speculation in the article. The trade throughout 1873 was exceedingly good, but in the first quarter of the present year imports have increased and exports decreased, but not to an extent to warrant the present estimate of the value of copper.

The West Coast charters for the months of January and February are 8100 tons, an increase of 2000 tons over the corresponding period of 1873. The shipments for the month of January have been 3602 tons, against 3516 tons in 1873.

The imports of copper into England for the first two months of the following years were:

1870.	1871.	1872.	1873.	1874.
6,280	11,345	15,312	10,296	13,267 tons.

The comparative positions from the 1st of April of the past four years with the present:

	Price.	Stock. Tons.	Stock incld'g afloat and chartered. Tons.
April 1st, 1870	£66	28,802	44,700
April 1st, 1871	£54	34,568	45,177
April 1st, 1872	£97	19,507	30,907
April 1st, 1873	£92	30,396	39,375
April 1st, 1874	£75	29,500	36,908

Tin.—The depression in this metal continues; the fall during March is equal to £10 per ton, and from the corresponding period of last year, £60. Till a correct estimate can be formed of the probable out-put of Australian, of the effect of this supply upon our own mines, and whether the shipments from the Straits will be as large as heretofore, it is vain to estimate the value of tin.

Spelter.—Prices of foreign have very much followed English, and some quantities are now offered of common Silesian and Rhenish brands at much lower prices than formerly ruled. Some English brands are still forced for sale below prices current for foreign make, and the exact value of this metal is not easy to arrive at.

Lead.—There has been a very good demand throughout the past month, and deliveries have been very difficult to obtain in anything like a reasonable time. The margin between pig and manufactured lead is very much larger since the recent failures.

Latest Liverpool prices are these:

TIN PLATES, F.O.B. IN LIVERPOOL, PER BOX.

Charcoal, I. C	£1. 16/ to £1. 19/
Coke, I. C	1. 9/ to 1. 11/

COPPER, DELIVERED IN LIVERPOOL, PER TON.

Bolt and sheathing	£100	Tough cake	£93
Tile	93	Best selected	95

Roofs and Roofing Materials.

I.

THE ROOFS OF OTHER AGES AND COUNTRIES.

It would be impossible to give a complete list of all the materials mankind has used at various periods and in different parts of the world for roofing purposes, but we may mention a few of them by way of introduction to some remarks upon the materials mostly in use in the United States.

In Eastern countries, such as Palestine, Arabia and Asiatic Turkey, the houses have flat roofs, which are generally formed by layers of branches, twigs, matting and earth laid over the rafters and trodden down; after which they are covered with a compost which acquires considerable hardness when dry. These roofs are not calculated to withstand the frequent rains of a humid climate, and, according to Dr. Kitto, in those parts of Asia where the climate is unusually moist "a stone roller is usually kept on every roof, and after a shower a great part of the population is engaged in drawing these rollers over the roof."

The earliest roofs of which we have any account are those of the Egyptians and Thebans, formed of layers of the large leaves of the palm, plastered with mud and then covered with mats. In warm climates palm leaves are used in many places as a thatch for the houses of the poorer classes. In Europe, tiles formed of baked earthenware were introduced at an early period, both in flat sheets or "plain" tiles, and of the semi-cylindrical form known as pan tiles. These are still used in many places in Continental Europe, as well as in some parts of England and Scotland, but require a strong framework to support them, as they are very heavy.

In ancient Greece the temples were covered with long, thin pieces of marble, sunk or worked hollow by the mason, so that the water could not run back under the point of junction. These roofs were very flat, and the same general idea of roof was adopted for the dwellings of wealthy citizens, and afforded a place for the inhabitants to breathe the fresh air in the evening and morning—a very desirable thing in those places where the climate for a great part of the year is semi-tropical.

In almost all the countries of the Old World the houses of the peasantry are covered with thatch made of straw, reeds, heather, broom or some other materials. In hot climates, and in many parts of Italy, the roofs are flat at the present day, and covered with a sort of concrete or cement, which is carried on joists like a floor—the object being to form a sort of terrace to walk on in the cool air of the early morning or late in the evening.

In Paris, France, since 1845 zinc has been almost universally used. It is much cheaper than tin plate and not much heavier, 100 square feet being estimated to weigh about one cwt., while slate weighs 5½ to 9 cwt., and lead, 5 to 7 cwt. Lead, as a material for making roofs, was much used during the middle ages for churches and cathedrals, but latterly lighter and cheaper substances have been used in its stead.

The roof is the essential part of the house, and has been often used to express the whole. To come under a person's roof is to enjoy his protection and society—to dwell with him. To be within our walls rather expresses the idea of being in our possession; a roof, therefore, is not only an essential part of a house, but it even seems to be its characteristic feature. The early builders in England and Continental Europe turned their attention to the ornamenting of their roofs as much as any other part of the building. They showed them in the most conspicuous manner, running them up to a great hight, breaking them into numerous fanciful shapes, and putting into them numbers of highly decorative windows.

AMERICAN MATERIALS AND METHODS OF ROOF CONSTRUCTION.

In this country the materials for roofing are numerous, but in this city the principal articles used are tin plate, slate and various kinds of manufactured roofing material, such as gravel, mica and asbestos. Concerning the qualities claimed for the different kinds of material used, we speak further on. At present we may say that the article in most favor here is tin plate, which has the advantages of being very light, requiring no heavy framework to support it, and being likewise comparatively cheap. It can also be applied to roofs of any kind of pitch, whether low or high. It costs at present from 9 cents to 13 cents per square foot, according to the quality of the tin and the size of the plates used, it being less expensive to use large plates than small ones, as they require less handling and solder. If it is of the best quality of charcoal tin, and properly put on, a tin roof, if kept in good repair and well painted, will last from twenty-five to thirty years. Slate, which is generally used for roofs of high pitch only, and Mansard roofs, weighs about 8 lbs., and costs, when fastened on planks, 12 cents per square foot. This material is also used for covering roofs made of corrugated iron, and upon those on some large buildings in this city which are filled in with fire brick, it costs, when applied on either of these, 18 cents per square foot. A roof filled in with fire brick and covered with slate, would seem to afford as complete a protection from fire as can be found, but the great weight of the materials and their expense renders them applicable only to large and strongly built structures. The slates are fastened on to the corrugated iron roofing by means of copper wire. The corrugated iron weighs 3 to 4 lbs. per square foot, and when to this is added 8 lbs. of slate it will easily be seen that the supporting walls must be massive. A slate roof on planks will, it is estimated, last about thirty years if the slates are of good quality and properly laid, that is, if lapped over each other sufficiently to keep out all moisture from the wood work. Gravel roofing, of which there are several manufacturers, is all substantially made of the same materials. These consist of a felt which is manufactured from woolen rags, grass and straw, and saturated with prepared coal tar. Three thicknesses or more of this felt are used upon the body of the roof, with the addition of two or three more in those parts of it most likely to be affected by water. It is cleated to the roof boards with metal or thin wooden cleats covered with felt and cement. The weight is about 45 pounds to 100 square feet. The felting is covered with a coating of a material termed variously roofing composition and asphaltic cement, made from a residuum of gas coal distilled at a temperature of nearly 600 degrees Fahrenheit. It is about the consistency of rosin, and is applied by means of iron kettles of peculiar construction. After being heated to about 300 degrees Fahrenheit, and in not less quantity than nine gallons to 100 square feet, there is as much clean white sea shore gravel put on as will embed itself in the cement and leave a loose layer on top. The cement contains, when applied to the roof, a very small quantity of oily substance, and is said to be entirely water-proof, and as nearly fire-proof as anything can be. This material has been used for about 27 years in various parts of the country, and is especially adapted to the roofs with a pitch not exceeding 2 inches to the foot. It is not suited for those of a high pitch. It has been extensively used in various parts of the United States and Canada, and roofs made of this material are more generally used than any other in Boston, Philadelphia, Baltimore, Chicago, St. Louis, Cincinnati, New Orleans and in New York for large buildings. This is due to the fact that they cost less and form as good, if not a better, protection from fire than almost any other material used. The cost is 6 cents per square foot, and, therefore, only about one-half the price of tin, while they do not require to be periodically painted as tin roofs do. They do not affect the taste of water—an important advantage in some parts of the country where the collection of water that falls from the house tops is a matter of consequence. The gravel roof has another advantage in not being liable to corrosion by the action of the sea air, and has, consequently, been used with much success on many of our ferry houses and piers. There are many buildings throughout the country which have been covered by this roofing from ten to twenty years without requiring repairs. It has grown very rapidly in favor, and it is stated that there are employed in the manufacture of the material and its application about 2000 men. The capital of the companies is $1,800,000. Among the many prominent buildings in the United States protected by this roof are the following: New York hotels—Fifth Avenue, Astor House, Windsor, Grand Central, Grand Union and Grammercy Park. Of railroad depots, the New York Central and Hudson River freight depot, St. John's Park, the Grand Central at 42d street, and the Hudson River at 30th street. Among insurance buildings, the Equitable Life, and the New York Life; beside the Ninth National Bank building, and nearly all the piers, bonded warehouses and ferry houses, and some of the finest residences on Fifth Avenue. In Jersey City the immense tobacco warehouse of Jarvis & Co., covering four acres, the Delaware, Lackawanna and Western Railroad, and the New Jersey Central Railroad companies' buildings are covered with the same material, also the New York Gas Light Companies' coal sheds in 21st street, covering an area of 3¼ acres; and in Brooklyn, the immense grain and tobacco warehouses of David Dows & Co., which contain millions of dollars worth of merchandise on storage. The fire insurance companies have accepted this roof, after subjecting it to the severest tests. A test which is often applied to satisfy those who wish to examine it for the first time, is to build a fire upon the roof sufficient to boil water in a kettle without the slightest damage to the roof by heat. There has been several instances of a building burning out entirely inside and leaving the roof intact.

The variety of roofing called asbestos roofing has been recently introduced, which presents some novel features, both as to the materials used in its manufacture and its adaptation to roofs of all degrees of pitch. Asbestos, as is well known, is indestructible by fire; possesses the quality of being fibrous, and is flexible to an extent which renders it, when properly prepared, capable of being felted or woven into cloth. It has been found in a great number of the States in the Union, and is supposed to exist in more or less quantity in many more. The roofing material of which this mineral substance forms a part, consists of a strong canvas, a surface layer of an abestos felt saturated with an acid and water-proof composition, and a manila lining which prevents adhesion to the roof boards. These materials, which ought to be of good quality, are joined together with intervening layers of the composition named above, and the whole is compressed into a compact flexible sheet, having some resemblance to leather, and forming a very strong and substantial foundation for the coating which is afterward applied to it. It is claimed for it that it is a perfectly water-tight roofing, with a smooth surface, which is proof against burning sparks and cinders, and being of such elasticity that it is not liable to injury from ordinary shrinking of roof boards. It is put up in rolls of about 39 inches wide containing 200 square feet, and weighs, with coating to finish, about 60 lbs. to 100 square feet. It is said to be fully as durable as tin, and costs, complete, $5 per square of 100 feet.

One advantage this roofing possesses over others that claim to be practically fire-proof is that it may be applied over shingles, by first nailing down all which are loose or badly warped.

It has received high commendation from competent judges, and has been used on a great many important buildings throughout the country, and being adapted for steep or flat roofs, in any climate, it certainly presents claims for consideration.

Mica canvas roofing has recently been introduced, and consists of a foundation of cotton canvas, saturated and coated with an elastic composition, which, it is claimed, will effectually exclude moisture and prevent rot. The upper surface of the roofing is protected by covering it with ground mineral isinglass, or mica, which is pressed into the waterproof composition, forming a surface resembling stone. It is said of this material that, on account of the mica being a reflector and non-conductor of heat, it makes a very cool roof in summer. It weighs about 50 lbs. per 100 square feet, and costs 6 cents per foot.

Drawing Metal Tubes.

We condense the following interesting account of the process of drawing tubes from "Byrne's Metal Worker's Assistant:"

The perfection of tubes is mainly dependent on the drawing process, conducted in a manner similar to that employed for drawing wire. Many of the brass tubes for common purposes, when they have been bent up and soldered edge to edge, are only drawn through a hole which makes them tolerably round and smooth externally, but leaves the interior of the tubes in the condition in which they left the fire after they were soldered, and nearly as soft as at first.

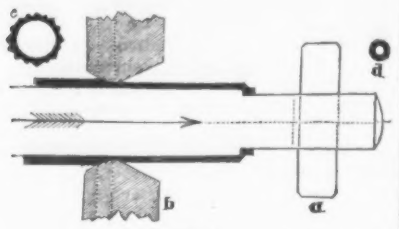


Fig. 1.

The sliding tubes for telescopes, and many similar works, are "drawn inside and out," and rendered very hard and elastic, by the method represented in Fig. 1, the form of the plate, *b* being exaggerated to explain the shape. For example, the tube, when soldered, is forced upon an accurate steel cylinder, or triblet, in doing which it is rounded tolerably to the form with a wooden mallet, so as to touch the mandrel in places; the end is set down with the hammer around the shoulder, or reduction of the triblet, and on the drawing tube and triblet, by means of the loose key, or transverse piece, *a*, through the draw plate, *b*, the tube becomes elongated, and contracted close upon the triblet at every part, as the metal is squeezed between the mandrel and plate. The fluted tubes for pencil cases, such as *c*, are drawn in this manner through ornamental plates, the

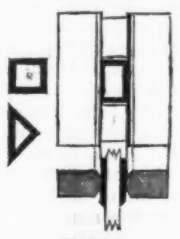


Fig. 2.

triblets being in general cylindrical. Some of the drawn tube called joint wire is much smaller than *d*, and is used by silversmiths for hinges and joints. It is drawn upon a piece of steel wire, which, being too small to admit the shoulder for holding on the tube, the latter is tapered off with a file, and the tube and wire are grasped together within the dogs, and drawn like a piece of solid wire. A semi-circular channel is filed half-way in both the parts to be hinged, and short pieces of the joint wire are soldered in each alternately.

Triangular, square, and rectangular brass tubes are in common use in France for sliding rules and measures. These are made in draw plates with movable dies, Fig. 2, which admit of adjustment for size. The dies are rounded on their inner edges, and are contained in a square frame with adjusting screws, and the whole lies against a solid perforated plate.

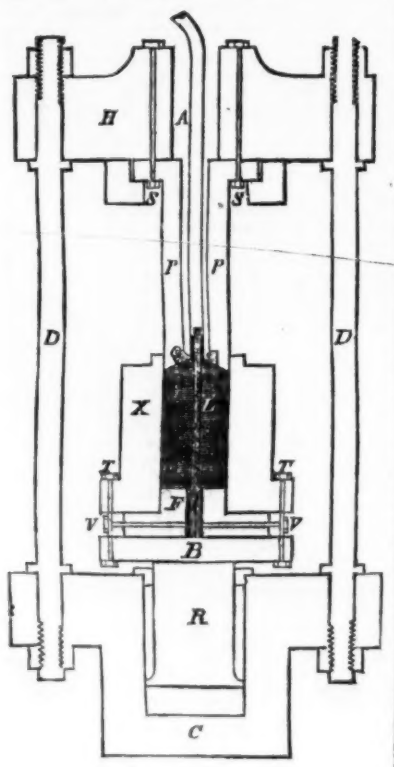


Fig. 3

In the general way, tubes of small diameters are completed at two draughts—sometimes three are used—and by this time the tube has received its maximum amount of hardness; therefore the first thickness of the metal and the diameter of the plates require a nice adjustment. The tube, when finished, is drawn off the triblet by putting the key through the opposite extremity of the same, and drawing the triblet through a brass collar which exactly fits it; this thrusts off the tube, which will, in general, be almost perfectly cylindrical and straight, except a trifling waste at each end.

It requires a very considerable assortment of truly cylindrical triblets to suit all works; and when the tubes are used in pairs, or to slide within one another, as in telescopes, it calls for a nice correspondence or strict equality of size between the aperture of the last draw plate and the diameter of the triblet for the size next larger; and, as these holes are continually wearing, it requires good management to keep the succession in due order, by making new plates for the last draught, and adapting the old ones to the prior stages. Sometimes, for an occasional purpose, the triblet is enlarged by leaving a tube upon it and drawing the work thereupon; but this is not so well as the turned and ground surface of the steel triblet.

Tubes from 1-10 inch internal diameter and 8 or 10 inches long, up to those of 2 or 3 inches diameter and 4 or 5 feet long, are drawn vertically by means of a strong chain, wound on a barrel by wheels and pinions, as in a crane. In Donkin's enormous tube-drawing machine, which is applicable to making tubes, or rather cylinders, for paper making and other machinery, as large as 26½ inches diameter, and 6½ feet long, a vertical screw is used, the nut of which is turned round by toothed wheels, driven by six men at a windlass.

All the tubes previously referred to are made of sheet metals turned up and soldered edge to edge, but lead and thin pipes for water and other fluids have for a long period been cast as thick tubes, some 20 to 30 inches long, and extended to the length of 10, 12 or 15 feet on triblets, which require to be very exactly cylindrical, or they cannot be withdrawn from the pipes.

The brass tubes for the boilers of locomotive engines are now similarly made by casting and drawing without being soldered, and some of these are drawn taper in their thickness.

The ductility of tin is very great. It is from the ordinary tin tube of commerce (which is cast about 2 feet long, ⅛ inch thick, and drawn out to about 10 feet) out of which is made the collapsable vessels for artists' oils and colors. Pieces 3 inches long were extended to 36 inches by drawing them through ten draw plates, which are sometimes placed in immediate succession, the one to commence just as the other had finished. The tube seemed to grow under the operation, and it was thus reduced, without annealing, from half an inch thick, as cast, to the 170th of an inch thick, and it was stretched fully sixty times in length. This mode of making the tubes of collapsable vessels has been superseded by another, presenting far greater ingenuity, and described hereafter.

Some of the smallest tin tube of commerce, when removed from the ten-foot triblet, is drawn through smaller plates without any triblet being used. This reduces the diameter, with little change of thickness, so that the half-inch tube becomes a nearly solid wire, measuring about ¼ inch diameter externally, which is known as beading, and used to form the raised ledges around tables and counters covered with pewter.

The accompanying sectional view (Fig. 3) shows the hydraulic press, and an arrangement for manufacturing lead pipe. The principle is claimed by Tatham, Cornell, Burr and others. C is the hydraulic cylinder, and R the ram rising from it. A cross-head is attached to the hydraulic cylinder, and connected with the upper cross-head H by rods D D. On the top of the ram a head-block B is placed. A foot-block F is attached to the bottom of the lead cylinder L, and the head-block, the foot-block, and the lead cylinder are secured firmly together by bolts T T. By this arrangement the lead "plug" or cylinder L is moved upward by the ram R of the hydraulic press. To the upper cross-head H the hollow piston P is attached by bolts S S. The die Q, placed at the lower end of the piston, hollow throughout, communicates with the aperture A in the upper cross-head. The movable core I, when in use, is firmly fixed to the head-block of the ram, and extends upward through the center of the lead cylinder, and a little above it, so that it is inserted through the die Q at the end of the hollow piston P. The position of the core is regulated by means of the set-screws V V, which move the core and set it centrally to the die. When all the parts are thus arranged the lead cylinder is raised up to the lower end of the piston, the end of the core passing through the die.

The ram is forced upward, carrying the cylinder X that contains the plug of lead L; this cylinder X passes over the hollow piston P. The pipe is formed at the point of pressure Q, it then passes through the hollow piston and out through the aperture A.

The Largest Tunnels of the World.—The completion of the Hoosac tunnel, and the rapid progress of the Sutro, have caused the miners, both in the East and in the West of America, to look with interest upon what has been, and is projected in connection with tunnel driving. It is in Germany that the great tunnels have been constructed, and these have been made exclusively for mining. There is the great tunnel at Freiberg, 24 miles long; the Ernst-August, and the Georg at Clausthal, 13½ and 10¾ miles respectively; the Joseph II. at Schemnitz, 9¼ miles; the Rothschonberg at Freiberg, 8 miles; the Mont Cenis, 7⅛ miles; which about completes the European list. In the United States we have the Hoosac, in Massachusetts, 5 miles long, the completion of which has lately been noticed; the Sutro, in Nevada, for opening up the celebrated Comstock lode. This tunnel, will, with its ramifications to the various mines of the district, prove one of the most important in America. The Sierra Madret tunnel at Black Hawk, commenced during the present year, and which will be twelve miles long, as well as the San Carlos and Union Pacific tunnels, which are under 2½ miles. The Ernst-August tunnel was driven at the rate of a mile per annum, and it will be interesting to notice how long it will take the Americans, with all the approved appliances at present at command to complete the nearly similar Sierra Madre tunnel.

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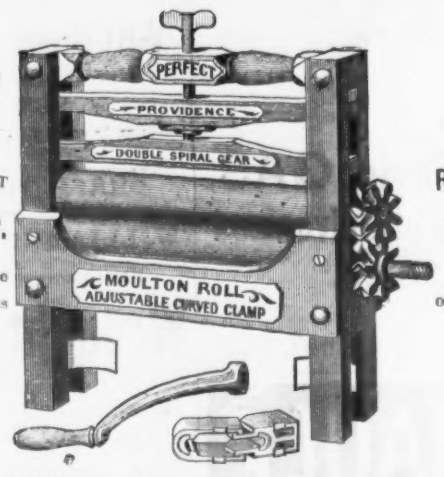

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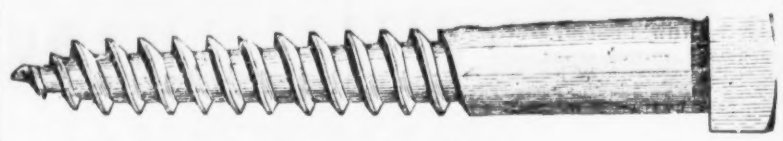

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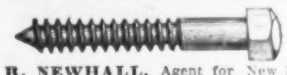

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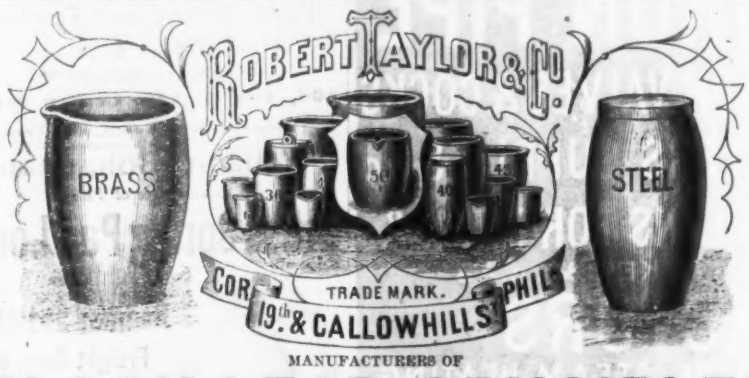

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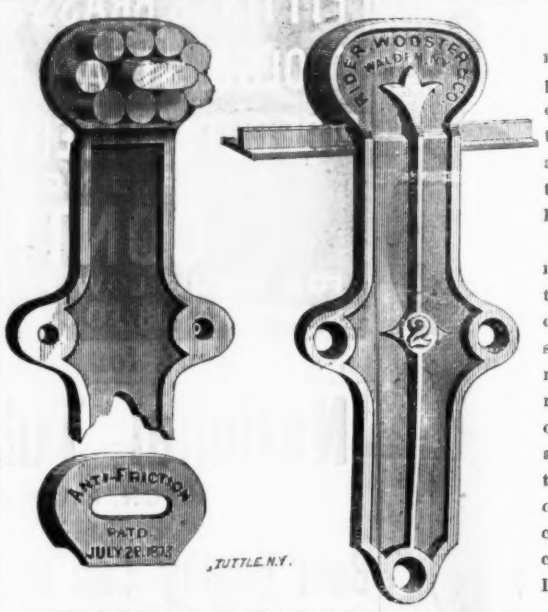

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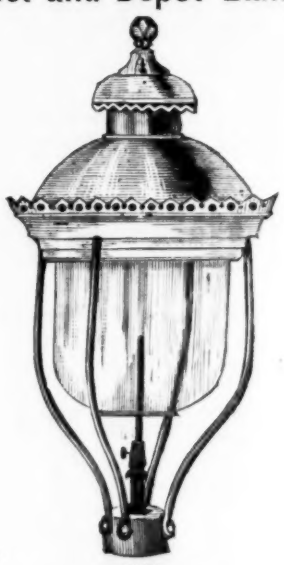

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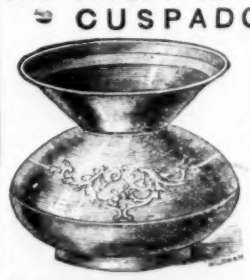

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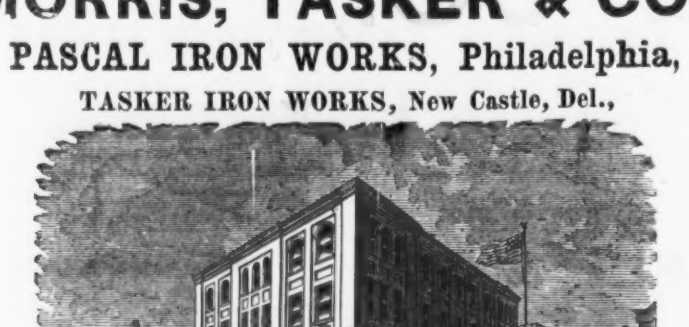

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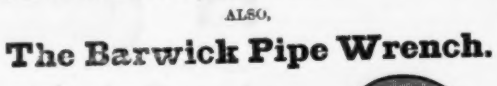

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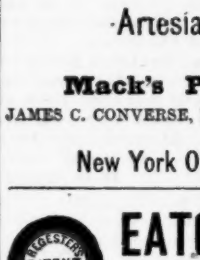

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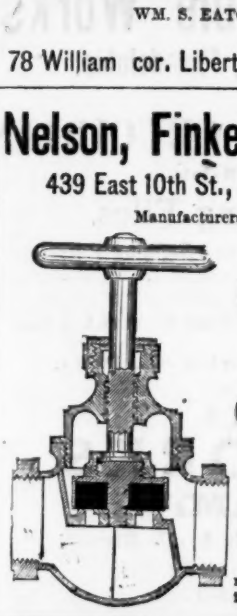

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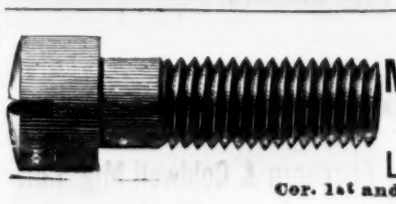

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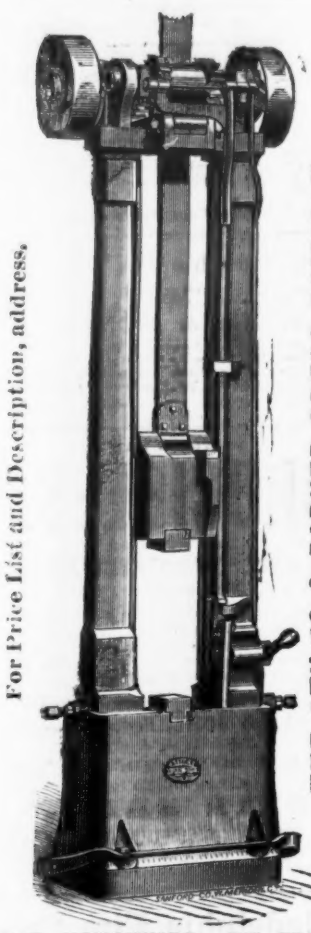

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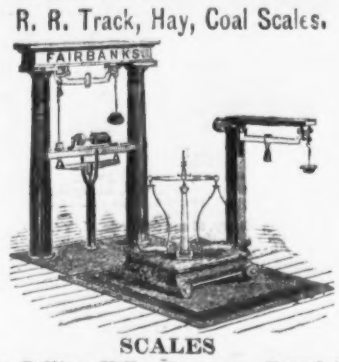

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FAIRBANKS, MORSE & CO., 182 Superior St., Cleve., O.
FAIRBANKS, MORSE & CO., 48 Wood St., Pittsburgh.
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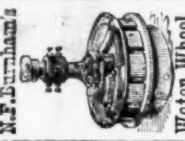
FAIRBANKS & HUTCHINSON, San Francisco, Cal.



WILLIAMS WHITE & CHURCHILL,
Successors to
MACKRELL & RICHARDSON MFG. COMPANY,
Manufacturers of
Builders' Hardware,
Locks, Hinges, Hooks and Staples,
Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS, &c.
Factory, cor. Flushing and Nostrand Avenues
BROOKLYN.
Warehouse, 73 Warren St., N. Y.

Metallurgical.

The Iron-Masters' Laboratory.

Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags & Coal for Practical Metallurgical Purposes.
No. 339 Walnut Street, Philadelphia.
J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical Iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of pure Iron in an ordinary Ore	$4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do	12 50
For each additional constituent of usual occurrence	1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.	
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel	12
For each additional constituent of usual occurrence	4 0
or the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone	10 00
For each additional constituent	2 00
or the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal	12 50

or determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.
Printed instructions for obtaining proper average samples for analysis furnished upon application.

SCHOOL OF MINES,
COLUMBIA COLLEGE,
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The plan of this school embraces a three years' course for the degree of ENGINEER OF MINES, or BATCHELOR OF PHILOSOPHY.

For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The next session begins October 2nd. The examination for admission will be held on June 23rd and September 29th, 1871. For further information and catalogues, apply to

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The Novelty Lawn Mower and Trimmer.

THE SIMPLEST,
CHEAPEST,
LIGHTEST,
AND BEST.

It has the only correct principle, viz.: the Field Mower Cut.

It is the only Lawn Mower that Can Cut Long Grass and do the Trimming.

Does all the Work of a Sickle or Shears.

It is the Lightest Machine in use, Weighing only Twenty Pounds. A Child can Work it.

The Construction is so Simple that it can not get out of Order.

PRICE LIST.

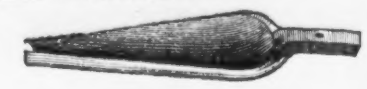
No. 1—14 inch Cut	$15 00
No. 2.—16 inch Cut	16 00
No. 3.—18 inch Cut	18 00
No. 4.—20 inch Cut	20 00

MANUFACTURED BY

GEO. DWIGHT, Jr., & CO.,
Hillman Street, Springfield, Mass.

COOPERS' TOOLS AND TRESS HOOPS.
CHAS. E. LITTLE, 59 Fulton Street, N. Y.
Agent for **Merchant's Improved Doweling Machines.** Send for Price Lists.

Solid Cast Steel Pump Auger.



Solid Cast Steel Pump Reamer.

CORLISS STEAM ENGINE.

The Best in the World for Economy in Fuel and Cost of Running.

BUILT BY
Robert Wetherill & Co.,
Chester, Pa.,
ENGINEERS, MACHINISTS, FOUNDERS
And BOILER MAKERS.
Stationary Engines, Shafting, Mill Gearing, Hoisting Machines, Steam Pistons and Machinery.
Special attention given to boring Ports and Cylinders, replacing Valves and Pistons in Corliss and other Engines.

Backus's Patent Bit Brace

AND

Angular Extension BORER.

Q. S. Backus,
SOLE MANUFACTURER OF
ANGULAR EXTENSION BORER.
Salesroom, 82 Chambers St., N. Y.

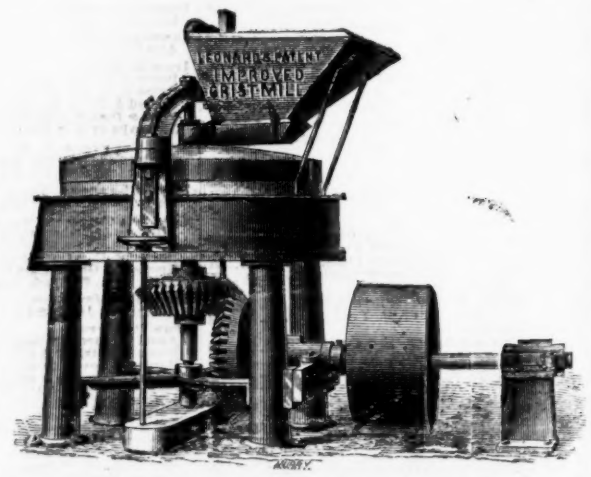
This tool can be used in any brace, at any angle, and also for straight work. Is the best and most convenient tool of its kind ever offered to the public. Eight thousand sold the first year.

Also Manufactures the Straight Extension

Backus's Pat. Improved Bit Brace.

The socket is arranged so that the strain does not come on the jaws, but on the square hole which fits the shank of the bit. The jaws attached to the sleeve hold the bit firmly in the square, and center it truly. The sweep is of wrought iron. The general finish of the stock is good. Its appearance is neat. Mechanics who have used it unanimously pronounce it superior to all others; and we offer it to the trade as the strongest, most simple, and quickest operating brace in the market. We manufacture five sizes. The number of inches of sweep corresponds with the commercial number of the list.

Burr Stone Flouring & Grist Mills,
LEONARD & SILLIMAN, Manufacturers,
BRIDGEPORT, CONN.
Send for Illustrated Catalogue and Price List.



THOMAS MORTON.
Manufacturer of
Brass & Copper Chain,

And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842.

Office, No. 15 Murray St., N. Y.

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SASH CHAIN.
THE BEST & CHEAPEST MADE.
Manufacturers of every description of
BUILDERS' HARDWARE,
Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,
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Chain and Pulley for Heavy Sash

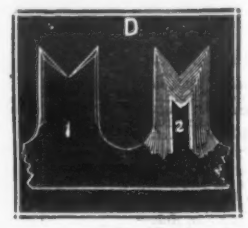
ATTENTION!! HALT!!

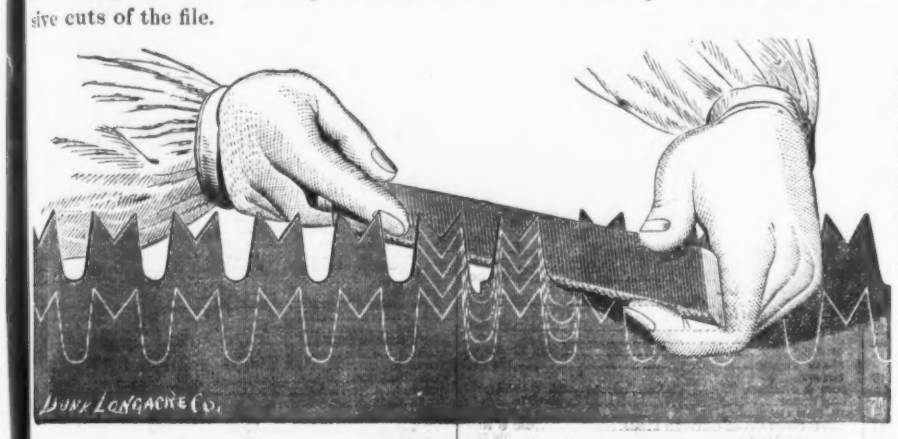
IMPORTANT to Hardware Dealers, Lumbermen, and all Parties interested in Cross-Cut Saws.

We desire to call special attention to our various styles of Cross-Cut Saws represented in this week's issue. In the manufacture of all our **Fast Cutting Saws,** we have carefully avoided the pernicious and destructive practice of making **UNDER-CUT TEETH.**

All saws made on this principle are miserable failures. It is simply a rip tooth to the purpose of cross cutting, an idea which has been long ago exploded. To get an **UNDER CUT**, the tooth must be wider at the extreme point than at any other part, and each successive filing must result in rapid reduction in the width and ultimate loss of shape, as shown in the annexed diagrams:

No. 1, Fig. C, represents the undercut tooth as it leaves the factory; Nos. 2, 3 and 4, Fig. C, shows how No. 1 must ultimately become under any style of filing that may be adopted. No. 1, Fig. D, shows a tooth with parallel edges, and No. 2, Fig. D, shows the shape of said tooth after several filings. The white line on the diagrams represent the successive cuts of the file.





On the other hand, the annexed engraving represents a section of Lumberman Cross-Cut Saw, with File specially adapted for keeping said Saw in order. By using the File here illustrated, with the edge made to fit the gullet or space between the teeth, and pressing downward while filing, you will preserve the original shape of the teeth as described by dotted lines and notch in engraving. You pay for the edge of the file as well as the flat—then why not use it? and thus keep your Saw always gummed and in order, and avoid the risk of breaking or buckling the Saw by the old method of gumming.

This File is manufactured expressly for the purpose of keeping in order the teeth of our Improved Saws, known as the Climax and Lumberman, and can be used with equal facility on either Saw. If the file be used according to our instructions, viz.: pressing down in the gullet at the same time the edge of the tooth is being filed, the effect will be so convincing that persons will never return to the use of the old style File, or any other of the so-called improved teeth. We also manufacture a File for keeping the Great American and Climax in order.

In introducing **The Great American** to the trade, we would remark that it has been subjected to the most severe tests, which have determined the fact that it is one of the Best Cross-Cut Saws ever offered to the public. The most important peculiarities of this Saw are as follows:

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more the centre tooth is beveled the faster the Saw cuts, whereas, if the centre tooth is filed square the Saw takes less hold on the log, and requires less muscle to drive it. You can thus regulate the Saw to suit the strength of the parties working it, and by increasing or diminishing the size of the teeth can adapt it to hard or soft wood

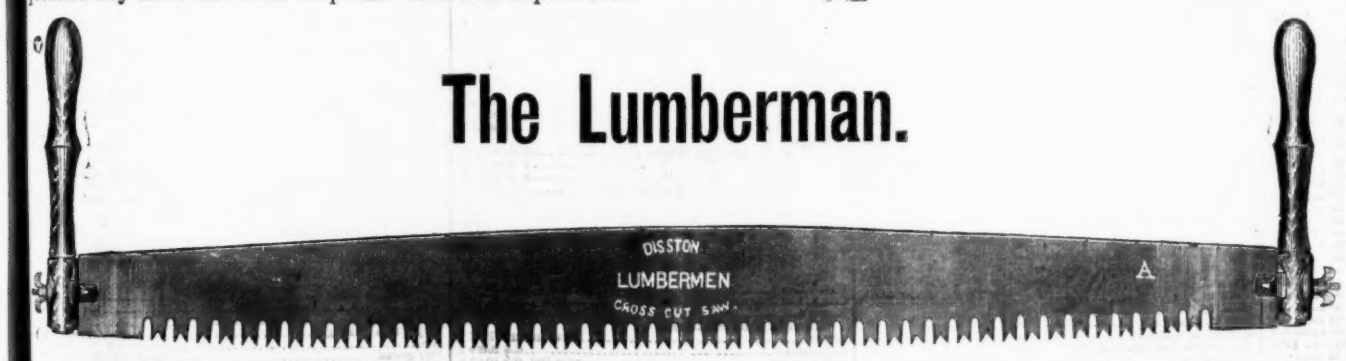
In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag,*" which in many other improved Cross-Cut Saws demand so much muscular exertion without a commensurate result.

We declare that there is no Cross-Cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-Cut.*"

The Great American.

The Lumberman is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the so-called fast cutting Saws of the present day must lose their shape and cannot be kept in order.

The Lumberman.



In filing the Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways the tooth can be kept at all time in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-Cut Handle, which is at once the most simple and complete detachable handle now in use. To attach the handle, place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use, an advantage which will be fully appreciated by all Lumbermen. We guarantee this handle to be superior to any in use.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

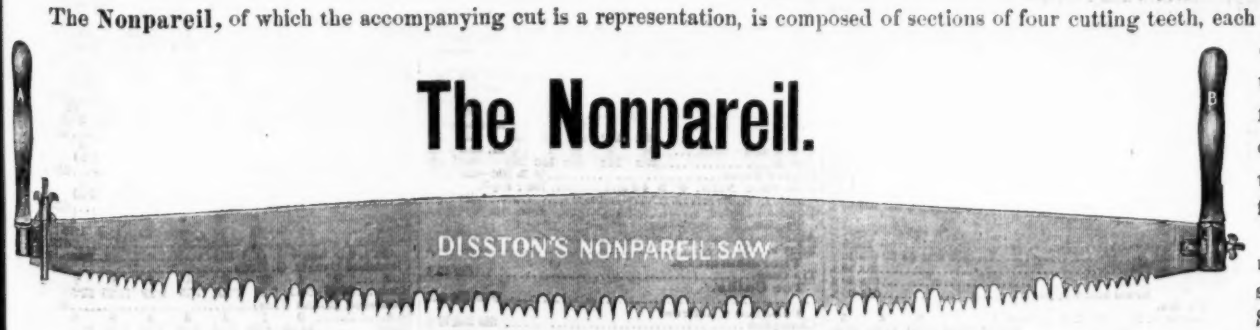
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A gauge for reducing the length of cleaner teeth will accompany each Saw.

The Climax.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose.)

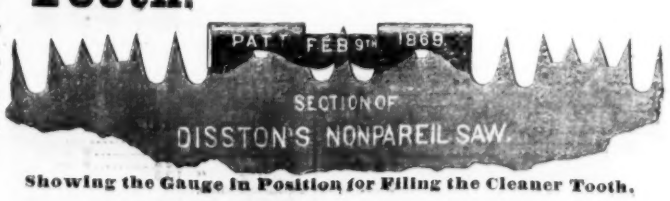
This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.

The Nonpareil.



Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of uniform length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled operator.



Showing the Gauge in Position for Filing the Cleaner Tooth.

HENRY DISSTON & SONS, Philadelphia.

New York Wholesale Prices, April 29, 1874.

HARDWARE.

Anvils.
Solid Cast Steel...₩ ℔ 14c
Wright's...₩ ℔ gold 13c ; over 250 ℔s 12½c, gold
Armitage's Mouse Hole...gold 11c
Wilkinson's...₩ ℔ gold 11½c
Eagle Anvils, ₩ ℔ 11c currency...dis 15 @ 15&5 %

Apple Parers.
Turn Table... } $8·50 ₩ doz
Lightning...
Hudson's...
Reading...
Union...₩ doz 9 00 } dis 5 %
Bay State, Paring, Coring and Slicing...15 00
Skeleton " " " ...9 00
Climax Slicer...9 00
Bay State Peach Parer...$11 00 @ 11 50
Lightning " " ...11 00 @ 11 50
Peach Stoner and Halver...7 00

Augers and Bits.
Snell Mfg. Co...dis 15 @ 20 %
Russell Jennings...dis 10 %
Douglass Mfg. Co., Extra...
" " No. 1...
" " Hollow Augers...
Cushman's Expanding Hollow Augers...dis 20 %
Ives' Augers and Bits...dis 30&10 %
" Gouge Lip Augers and Bits...dis 30&10 %
" Hollow Augers...dis 30&10 %
" Expansive Hollow Augers...dis 30&10 %
" Expansive Bits...dis 20&10 %
Andrews' Bits...dis 25 %
Clark's Expansive Bits...dis 15 %
Cook's Patent Augers...dis 50 %
" " Bits...dis 40 %
Shepardson's Double Cut Bits...dis 20 %
Griswold's Patent...dis 20 %
Cast Steel Cut Augers...dis 30&10 %
" Auger Bits...dis 30&10 %
Gimlet Bits...dis 10&10 %
Long Augers...new list dis 30 %
Bonney's Patent Hollow...$48 per doz—dis 25 %
Stearns' " " ...$48 per doz—dis 25 %
Morse's Bit Stock Drills...dis 20 %
Nobles Mfg. Co. C. S. Cut Augers...dis 30&10 %
Watrous Ship Augers...dis 10 %
Vaughan's Post Hole—
6 in. $23 60 ; 9 in. $25 per doz...dis 20 %

Axes.
Blood's...$12 50 @ 14 00
Hunt's...₩ doz $15 00 @ 17 50 net @ dis 5 %
Collins'...₩ doz 11 00 @ 15 50 net @ dis 5 %
Hurd's...₩ doz 12 50 @ 13 50
Schweitzer Mfg. Co.'s...₩ doz 13 00 @ 15 00
Simmons'...₩ doz 12 50 @ 14 00
Morris'...₩ doz 12 50 @ 13 50
Red Jacket...₩ doz 12 00 @ 12 50
Mann's...₩ doz 12 50 @ 13 00
Double Bitted...₩ doz 21 50 @ 22 00
Fowell Tool Co., "Peerless"...₩ doz 13 00 @ 14 50
Underhill's...₩ doz 12 50 @ 13 50
" Crown...₩ doz 13 00 @ 14 00
John Leverett's...₩ doz 12 50 @ 15 50
Nobles Mfg. Co. S. B...₩ doz 12 50 @ 13 00
" D. B...₩ doz 22 00 @ 23 00

Balances.
Chatillon's... } new list dis 15 %
Frary's...
Morton's...

Bands.
Plated...new list dis 50&5 %
Iron Rim...new list dis 15&5 %
Brass (Plated list)...new list dis 50, 10&5 %
Oroide...new list dis 50&5 %

Bells.
Hand, Light Brass...dis 60&10 @ 65&10 %
White Metal...dis 50&10 %
Swiss...dis 50 %
Globe...dis 15&10 %
Abbe's...dis 10&10 %
Taylor's Patent Door...net
Western Gong...net
Brook's Crank...dis 10 %
" Pull...dis 15&10 %
Hart Mfg. Co., Crank and Pull...dis 50&10 %
Cow—Common Wrought...dis 20&10 %
Western...new list dis 20&10 %
Kentucky "Star"...new list dis 20&10 %
Dodge's Genuine Kentucky...new list dis 25 %
Yaw's Genuine...dis 20 %
Texas...dis 20&10 %
Call...dis 15 %

Bellows.
Blacksmiths'...dis 15 %
Moulders'...dis 15 %
Hand Bellows...dis 10 %

Blind Fasteners.
Van Sand's...₩ gross $14 00
Washburn's Patent...₩ gross 14 00
Merriman's...

Blind Staples.
Boardman's Patent, ⅜ in. and larger...₩ ℔ 37 c
" ⅝ in...₩ ℔ 42 c

Bolts.
Carriage and Tire, Ætna Nut Co...dis 60 %
Stove, Ætna Nut Co...dis 10&5 %
Cast Iron Barrel, Shutter, &c...new list dis 60&10 %
Wrought Iron Barrel...new list dis 50&10 %
" " Square...new list dis 50&10 %
Wrought Iron Flush...dis 15 %
Carriage and Tire, Common...dis 70&10&5 %
" " " Norway Iron...50&10 %
Star, Philadelphia...dis 50 @ 50&10 %
Eagle, Philadelphia...dis 50 @ 50&10 %
Philadelphia Pattern, P. S. & W...dis 50&10 %
Tire, Bessemer Steel, Hubbard & Curtiss...dis 50 %
Carriage and Tire, R. B. & W...old list dis 50&5 %
Plow, R. B. & W...dis 30 %
Stove, R. B. & W...dis 10 %
" Shelton Co. Shaved Heads...dis 15 %
Union Nut Co., old list...dis 50&20 %
" " Stove...dis 15 %
Machine...dis 30&10 @ 40 %

Borax.—In cases of 100 lbs...₩ ℔ 18c

Boring Machines.
Kellogg's...dis 15 %
Snell Mfg. Co., Rice's Patent...dis 15 %
" " Regular...dis 15 %
Douglas Mfg. Co...dis 20 %
Morticing Machines each...$18 00

Bow Pins...dis 50 %

Braces.
Barber's Patent...dis 40&5 %
Wilson Mfg. Co...new list dis 10 %
Spofford's Patent...dis 40&5 %
Noble's Patent...dis 40&5 %
Bartholomew's American Ball...dis 10&10 %
" Patent Grip...dis 40 %
Ives' Novelty...dis 40&5 %

Bull Rings...dis 50 %

Bung Hole Borers.
Common and Ring...dis 25 %
Enterprise Mfg. Co...dis 20&10 %
Ives' Tap Borers...dis 25 %

Butchers' Cleavers.
Bradley's...dis 25 %
Beatty's...new list dis 10 %
2 3 4 5 6 7 8 9
$19·00 $21·50 $24·00 $27·00 $30·00 $33·50 $36·50 $40·00
Hart Mfg. Co...dis 45&10 %
0 1 2 3 4 5 6
$25·25 $29·75 $30·25 $38·75 $43·55 $48·50 $54·00

Butts.
Wrought Brass...new list dis 30 %
Cast Fast Joint, Narrow...dis 50 %
" " Broad...dis 50 %
Cast Loose Joint...dis 60 %
" " Mayer...dis 50 %
" " Parliament...dis 50 %
Loose Pin...dis 40&10 %
Wrought Fast Joint, Narrow...dis 30 %
Wrought Broad...dis 35 %
" Loose Joint...dis 35 %
Wrought Table and Back Flaps...dis 30 %
Palmer Blind Butts...dis 30&10 %
Nicholson Blind Butts...dis 40&10 %
Parker's Blind Butts...dis 45&10 %
Huffer's Blind Butts...dis 30&10 %
A. S. Parker's...dis 40&10 %
Clark's Surface Blind Hinges, Nos. 1, 3 and 5...dis 50 %
" " " " No. 20...dis 55&10 %
" Mortise " "...dis 30&5 %
Seymour's...dis 40&10 %
Shepard's...dis 50 %
Garretson's...No. 1, dis 5&10 % ; Nos. 2 and 7, dis 50 %
The American Spiral Spring Butt Co...dis 20 %
Standard...dis 50 %

Caps—Percussion, per 1000.
G. D...40c
Ely's E. B...1-4s, 58c ; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1·45 ; 1-10s, $1·52½c., gold
Colt's...1-10s 70c., gold

Cartridges.
Metallic...dis 50 @ 50&10 %

Cards.—Horse and Curry...dis 25&10 %
Cotton...new list dis 10&10 %
Wool...new list dis 10&10 %

Carpet Stretchers.
P. S. & W...per doz $2 00 ; dis 33⅓ %

Casters.
Iron and Wood Wheel, Bed...dis 33⅓&10 %
Brass and Porcelain Wheel, Bed...dis 33⅓&10 %
Deep Socket, Bed...new list dis 20&10 %
Iron and Wood Wheel Plate...new list dis 33⅓&10 %
Brass Wheel Plate...new list dis 33⅓&10 %
Porcelain Wheel Plate...new list dis 33⅓&10 %

Cattle Leaders...dis 50&10 %

Chain
English Coil, by the cask...net gold
₩ ℔...13 9½ 9 8½ 8¼ 8c
5-16 ⅜ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2...by the cask, ₩ pair, gold, 60c
Trace, 7-10-2...by the cask, ₩ pair gold, 65c
Galvanized Pump Chain...₩ ℔ 13c
German Halter Chain...new list, Jan. 1, dis 10 %
German Coil...new list, Jan. 1, dis 10 %
Jack Chain, Iron...dis 50 %
" Brass...dis 40 %

Chalk.
White...₩ gross, 50c
Red...₩ gross, 75c
Blue...₩ gross, 90c
Crayons...₩ gross, 14c

Cherry Stoners.
"Family"...₩ doz $9·00

Chisels.
Socket Firmers...dis 60 @ 60&10 %
Socket Framing...dis 60 @ 60&10 %
Socket Corner...dis 60 %
Tanged Firmers...dis 40 to 40&10 %
Butcher's...$5·50 to £ gold—new list
Newbould's...$5·50 to £ gold
Spear & Jackson's...$5·50 to £ gold—new list

Clips, Axle.
Norway or Best...dis 30 %
Superior...dis 50 %
"Star," Superior Philadelphia...dis 45&5 %

Coal Shovels.
Iron Handled...₩ doz, $ 85 @ 1 25
Wooden Handled...₩ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co...dis 35 %
No. 14 15 16 17 18
Japanned...$9·00 9·75 10·50 12·00 13·50 per doz
Galvanized...13·00 14·50 15·50 17·50 19·50 "
Morning Glory...dis 30 %
No. 15 16 17
Japanned...$12·50 13·50 15·50 per doz
Galvanized...18·00 19·50 21·00 "

Cockeyes...dis 30 %

Cocks.
Brass Racking...dis 25&10 %
Lock and Globe...dis 25&10 %

Coffee Mills.
Board and Box...dis 15 %
Increase Wilson's...new list dis 15 %
Selsor's Pat...$9·50, $10·50—dis 25 %
French Steel...dis 15 %
The Swift...dis 25 %
"American"...dis 20 %
Enterprise Mfg. Co...dis 20&10 %

Compasses and Dividers.
Bemis...dis 35 %
Excelsior...dis 30 %
Peck Stow & Wilcox...dis 25 %

Coopers' Tools.
Bradley's...dis 15 @ 20 %
Chas. E. Little...dis 20 @ 25 %
Swan & Brombacher...dis 15 @ 20 %

Corn Knives and Cutters.
Bradley's...dis 10 %

Crow Bars.
Cast Steel...₩ ℔ 11c.net
Iron, steel points...₩ ℔ 7c

Crucibles.
Gautier & Co...₩ No. 5½c

Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass...dis 15 %
Fitch's...dis 15&10 %
Rubber...₩ doz, $9·00—dis 15 %
Schweitzer Mfg. Co...dis 20 %

Curtain Pins.
Silvered Glass...old list dis 45&10 %

Cutlery.
American Table...net list
American Pocket...dis 25 %

Dog Collars.
Embossed Gilt...dis 15 %
Leather...dis 20 %

Door Springs.
Gray's...$7·50 per doz—dis 40&10 %
Torrey's Patent...$7·50 ₩ doz—dis 40&10 %
Palmer's Japanned No. 6...₩ doz $5·00
" Coppered " ..."6·00
" Silvered " ..."8·00
Challenge.—
Japanned...₩ doz $4 00 @ 6 00
Bronzed...₩ doz 5 00 @ 7 00
Nickel Plated...₩ doz 6 50 @ 9 00
1 Gross lots...dis 10 %
5 Gross lots...dis 20 %

Drawing Knives...dis 60 @ 60&10 %
Bradley's...dis 25 %
Adjustable Handled...dis 10 %

Drills.
Ingersoll's Ratchet...dis 25 %
Moore's Triple Acting Ratchet...dis 20 %
Whitney's Ratchet...dis 20 %
Blacksmiths'...each $3 25 net

Drug Mills.
American Drug Mills...dis 20 %

Egg Beaters.
Monroe's...₩ doz net $8·25 @ 8·50
Dover...₩ doz net $6·00
National...₩ doz $4·50—dis 10 %
Peerless...₩ doz net $4·00

Emery.
Genuine Chester—Regular Nos...₩ ℔ 7c } dis 5 @ 10 %
" Flour and FF...₩ ℔ 4c }
Washington Mills—Regular Nos...₩ ℔ 8c
" Flour...₩ ℔ 5c

Enameled and Tinned Ware.
Kettles...dis 20 @ 25 %
Sauce Pans, Glue Pots, &c...dis 15 %

Escutcheons.
Brass Thread...dis 60&10 %

Faucets.
Cork Lined, Wood...dis 60 %
Fenn's...dis 50 %
" Cork Stops...dis 40 %
Star...dis 55&10 %
Frary's Patent Petroleum...dis 10&10 %
Taylor's Pattern...dis 20&10 %
Wood and Metallic...dis 40 %

Felloe Plates...₩ ℔ 14c ; dis 10 %

Files.
Nicholson...$5 00 to £ currency—dis 10 %
Newbould's...5 25 to £ gold
J. & Riley Carr's...5 50 to £ gold
" " Rasps...5 75 to £ gold
Stubs'...8 50 @ 9 00 to £ gold
Butcher's...5 50 to £ gold
Walter Spencer & Co.'s "Diamond"...5 25 to £ gold
Spear & Jackson's...5 50 to £ gold
Hargreaves, Smith & Co.'s...5 00 to £ gold
Jowitt's...5 25 to £ gold
"Western"...5 00 to £ net
W. K. & C. Peace's "Imperial"...5 25 to £ gold
R. Ibbotson...5 00 to £ gold
Beam & Murray, "Cyclops"...4 85 to £ gold
Fisher's...4 75 to £ gold
Goodlad's...4 00 to £ gold
Moss & Gamble...5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.)...5 00 to £ gold
" Horse Rasps...5 50 to £ gold

Floral Tools...dis 25 %

Fluting Machines.
Acme...$7 00 each net
Manville, No. 2...7 00 each net
Knox, with 4-inch Rolls...5 00 each net
" " 6 " ...6 00 each net
O. K...6 50 each net
Peerless, 4-inch Rolls...4 00 each net
" 5 " ...5 00 each net
Excelsior, No. 1...4 75 each net
" No. 2...6 50 each net
Diamond...7 50 each net
Climax 7-inch Rolls...8 00 each net
" 4½ ...6 50 each net
Empire...4 00 each net
Eureka, No. 1, 7-inch Roll...8 00 each net
" No. 2, 5-inch Roll...6 00 each net
K. F. M., 4½-inch Roll...5 50 each net
" 6-inch Roll...6 00 each net
Myers' Fashion Fluter, 4½-inch Rolls...3 00 each net
" Convex Brass Fluter, Sad Iron attachment...$1·75
Domestic Fluter...$1·75 each net
Fairy, Self-Heater...8 00 each net
Geneva Hand Fluter...$15 00 per doz net
Champion, 6 inch rolls...$6 00 each net
" 4 inch rolls...$5 00 each net
Mrs. Coles, 7 inch rolls...6 50
" 5 " ...5 50

Forks.
Hay, Manure & Spading...dis 25 %
Plated A 1...dis 30&5 %

Freezers.
Torrey's...dis 30 %

Fry Pans.—P. S. & W.
Tinned...dis 25 %
₩ doz...$3·00 3·25 3·62 4·00 4·50 5·00 5·50 6·00 7·50
No...0 1 2 3 4 5 6 7 8
Smith, Burns & Co., "Excelsior" Polished...dis 35 %
₩ doz...$3·70 4·00 4·70 5·30 6·00 7·00 8·00 9·00
No...1 2 3 5 6 7 8

Gauges.
Marking...dis 45&10 %
Wire...dis 10 %

Hammers.
Emmet Hammer Co...dis 10 %
Maydole's...dis 5 %
Cheney's...new list net
Verree...dis 5 %
Yerks & Plumb...new advanced list dis 5 @ 10 %
Minot & Co...dis 15 %
Magnetic Tack...dis 20&10 %

Handles.
Hammer and Hatchet...dis 10 %
Quakertown, Axe, Pick and Sledge...dis 10 %
" Hammer and Hatchet...net
Greensboro', Axe, Pick, Hammer, &c...dis 10 %
Woolworth Axe, Pick and Sledge...dis 10 %
Brad Awl...per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td...5 25—dis 10&10 %
" " large...6 25—dis 10&10 %
Apple " " ass'td...6 00—dis 10&10 %
" " " large...7 00—dis 10&10 %
Socket " " ass'td...3 50—dis 10&10 %
" Framing " ...6 00—dis 10&10 %
File...3 50—dis 10&10 %
Auger...5 50—dis 10&10 %
" large...6 50—dis 10&10 %

Hangers.
Barn Door...revised list dis 60&10 %
"Anti-Friction" (Rider, Wooster & Co.)...dis 30 %
Novelty...dis 30 %

Harness Snaps.
Henshaw's...dis 25&10 %
Judd's...dis 40 %
Fitch's...dis 30 %
Hotchkiss'...dis 10 %
Andrews'...dis 25 %
Sargent's...new list dis 50&10 %

Hatchets.—Isaiah Blood...dis 10 %
Shingling, Nos. 1 2 3...₩ doz $7 50 8 00 8 50
Claw, " 1 2 3...₩ doz 8 50 9 00 9 50
Lathing, " 1 2 3...₩ doz 7 50 8 00 8 50
Hunt's...dis 10 %
Shingling, Nos. 1 2 3...₩ doz $7 25 8 00 8 75
Claw, " 1 2 3...₩ doz 7 75 8 50 9 25
Lathing, " 1 2 3...₩ doz 7 50 8 25 9 00
Hurd's...dis 20 %
Shingling, Nos. 1 2 3...₩ doz $8 00 8 50 9 00
Claw, " 1 2 3...₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3...₩ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s...dis 25 %
Shingling, Nos. 1 2 3...₩ doz $6 50 7 00 7 50
Claw, " 1 2 3...₩ doz 7 25 7 75 8 25
Lathing, " 1 2 3...₩ doz 6 50 7 00 7 50
Yerks & Plumb...dis 10 %
Shingling, Nos. 1 2 3...₩ doz $7 00 7 50 8 00
Claw, " 1 2 3...₩ doz 7 50 8 00 8 50
Lathing, " 1 2 3...₩ doz 7 00 7 50 8 00
Simmon's...dis 15 %
Shingling, Nos. 0 1 2 3...₩ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3...₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3...₩ doz 8 00 8 50 9 00
Broad, " 1 2 3...₩ doz 9 00 10 00 12 00
" " 4 5 6...₩ doz 14 00 16 00 18 00
" " 7 8...₩ doz 20 00 22 00
Elephant...dis 25 %
Shingling, Nos. 1 2 3...₩ doz $8 00 8 50 9 00
Claw, " 1 2 3...₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3...₩ doz 8 00 8 50 9 00
J. P. Verree & Co...dis 5 %
Shingling, Nos. 1 2 3...₩ doz $7 00 7 50 8 00
Claw, " 1 2 3...₩ doz 7 50 8 00 8 50
Lathing, " 1 2 3...₩ doz 7 00 7 50 8 00
Underhill's...dis 10 %
Shingling, Nos. 1 2 3...₩ doz 7 25 8 00 8 75
Claw, " 1 2 3...₩ doz 7 75 8 50 9 25
Lathing, " 1 2...₩ doz 11 00 12 00

Hinges.
Wrought Strap and T...dis 25&7½ %
Providence Plate. { 6 and 8 in. list 11c. / over 8 in. list 9½c. }...dis 20 %
Screw Hook and Strap...{ 8, 10, 12 in. 8c / 14 to 36 in. 6½c }...net
Heavy Welded Hook...{ 8 to 12 in., 9c / 14 in. & up, 8½c } dis 10 %
Screw Hook and Eye...{ ¾ to 1 in., 9½c / ⅝ in. 10½c / ½ in. 12½c }...net

Hoes.
Solid Shank, C. S...₩ doz $8 00—dis 20 @ 30 %
Socket...₩ doz 9 00—dis 20 @ 30 %
Riveted Eye...₩ doz 5 00—dis 20 @ 30 %
Grub...dis 20 %
Planters'—Winsted...add 10 %
" Scovill...add 33⅓ %
Scovill Pattern (Winsted)...add 20 %

Hooks.
Belt...dis 50 %
Clothes Line...dis 60&10 %
Bench—Skinner's...per doz $8 00, dis 30 %
Bench—Hotchkiss' $5 00 ₩ doz...dis 10 %
Bench—Weston's No. 1, $6·50 ; No. 2, $7·00 per doz net
" —McGill's...$3 00 per doz, dis 10 %
Wardrobe, Japanned...new list dis 60&10 %
Hat and Coat "...new list dis 60&10 %
Wrought Staples and Hooks and Staples...dis 60, 10&10 %
Screw Hooks and Eyes, revised list...dis 70 %
Grass...dis 20 %
Whiffletree—Patent...dis 30 %
Hooks and Eyes—Malleable Iron...dis 50 %
" Brass...dis 50&10 %

Horse Nails.
Putnam's.
No...5 6 7 8 9 10
32c 28c 26c 25c 24c 23c
In lots 2000 lbs. dis. 5 %.
Ausable
No...5 6 7 8 9 10
30c 27c 25c 24c 23c 22c
Pointed & finished...31c 28c 26c 25c 24c 23c
Clinton...22c 19c 17c 16c 15c 14c
In lots of 1000 lbs. 5 % discount.
Brundage.
No...5 6 7 8 9 10
29c 26c 24c 23c 22c 21c
In lots of 500 lbs., dis. 5 %.
American Pressed.
No...5 6 7 8 9 10
22c 20c 20c 20c 20c 20c
In lots of 1000 lbs. dis 5 %.
Perkins Finished (ready to drive).
No...5 6 7 8 9 10
31c 28c 26c 25c 24c 23c
In lots of 1000 lbs. dis 5 %.
Buffalo Forged.
No...6 7 8 9 10
28c 26c 25c 24c 23c
Globe (Pointed and Polished).
No...5 6 7 8 9 10
31c 28c 26c 25c 24c 23c
In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished).
No...5 6 7 8 9 10
Patent Finish...28 25 23 22 21 20
Extra...30 27 25 24 23 22
In lots of 1000 lbs., dis 5 %.
Vulcan (Blued, pointed, ready to drive).
No...5 6 7 8 9 10
33c 30c 28c 27c 26c 25c
In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.
New London Horse Nails.
No...6 7 8 9 10
Great Western...27c 25c 24c 23c 22c
U B...29c 27c 26c 25c 24c
In lots of 1000 lbs., dis 5 %.
Star Brand...₩ ℔ 16c
Morgan...14c

Horse Shoes.
Burden...₩ keg, $5 87½
R. I. Horse Shoe Co., Perkins Pattern...₩ keg, 5 87½
" " R. I. Pattern...₩ keg, 6 37½
Mule Shoes...₩ keg, 6 87½

Kettles.
Brass...₩ ℔ 55c net
In lots of 500 ℔s...₩ ℔ 50c net

Knives.
Ames' Butcher Knives...dis 20 %
" Shoe "...dis 15 %
Hay and Straw, "Wadsworth's"...dis 20 %

Knobs.
Base—Common...net
" Plush Tip...dis 10 %
" Elastic End...reduced list dis 10&10 %

Ladles.
Melting...dis 20 %

Lanterns.
Brady's Patent...dis 10 %
Ætna...dis 10 %
Yankee...dis 10 %
De Beque...dis 10 %

Locks and Latches.
Cabinet—Eagle...dis 25 %
Cabinet—Gaylord...dis 25 %
Trunk...dis 10 %
Continental...dis 15 %
Shepardson's...dis 20 %
American Lock Co...dis 33⅓ %
Plate...dis 25 %
Pad...new list dis 50, and 2 % for cash
Barnes & Deitz...dis 25 %
Yale Lock Co...dis 40 %
Sargent & Greenleaf...dis 20 %
Trenton Lock Co... } New list dis 45 %. 2 % extra for cash.
Branford...
Norwich...
Russell & Erwin...
Norwalk...
Nashua...
Mallory, Wheeler & Co...
P. & F. Corbin...
Parker & Whipple...
Jacobus & Nimick Mfg. Co...

Mallets.
Hickory and Lignumvitæ...dis 10&10 %

Meat Cutters.
Dixon's (P. S. & W.)...dis 10 %
No...1 2 3 4
₩ doz...$14 00 $17 00 $19 00 $30 00
Hales'...dis 25 %
No...11 12 13
₩ doz...$27 00 $33 00 $42 00
Miles Challenge...dis 20 %
No...1 2 3
₩ doz...$22·00 $30·00 $40·00
Perry's Champion (P. S. & W.)...dis 10 %
No...200 300 400
₩ doz...$22 00 $27 00 $40 00
Woodruff's (P. S. & W.)...dis 10 %
No...100 150
₩ doz...$15 00 $18 00
American...dis 25 @ 25&5 %
No...1 2 2½ 3 4 5
Each...$6 00 $9 00 $14 00 $15 00 $30 00 $75 00

Molasses Gates.
Stebbins' Pattern...dis 60&10 %
Tinned ends...dis 40&10 %
Patent Self-Measuring...per doz $42 00—dis 20&10 %
Bush's...dis 20 %
Lincoln's...dis 50&10 %

Mortars and Pestles.
Iron...net

Mouse Traps.
Wood Choker...₩ doz holes, 16 @ 18c
Round, Wire...₩ doz $1 50 to 2 00 net
Square, "...₩ doz 2 00 to 2 50 net
Cage, "...₩ doz 2 50, dis 10 %

Nails.—See Trade Report.

Nuts and Washers.
Nuts...large, 5½c ; small, 7½c off list.
Washers...large, 7c ; small, 9½c off list.

Oil Stones.
Washita No. 1...₩ ℔ 22c
" Slips...₩ ℔ 45c
Washita No. 2...₩ ℔ 17c
Arkansas...₩ ℔ 1 25
Hindostan...₩ ℔ 6c dis 10&10 %
" Slips...₩ ℔ 10c dis 10&10 %

Oilers.
Olmsted's...new list dis 25&10 %
Broughton's...dis 25&5 %
Malleable...per doz $5 00 dis 10 %
Common Tin...dis 30 %
" Zinc...dis 30 %
" Brass and Copper...dis 30 %

Picks.
Washoe R. R...dis 25 %...Nos. 1 3 4 5
₩ doz...$14·00 15·00 16·00 17·00 18·00
Washoe Coal, dis 20 %...$8·50 9·00 10·00 11·00 13·00 15·00
Extra 10 % dis 25 doz in 6 months, ending Jan. and July.

Picture Nails and Knobs.
Richards' Patent...dis 40 @ 40&10 %

Pinking Irons...per doz $3 00—dis 60&10 %

Planes.
Chapin's, 1st quality...dis 30 %
Sandusky Tool Co., 1st quality...dis 30 %
" " 2d " (Ogontz)...dis 40 %
Ohio Tool Co., 1st quality...dis 30 %
" " 2d quality (Sciota)...dis 40 %
Owasco Tool Co., 1st quality...dis 30 %
" " 2d quality...dis 40 %
Howland's, 1st quality...dis 30 %
Bailey's Patent Adjustable...dis 20&10 %
Plane Irons, Butcher's...$5 50 to £ gold—new list
" Chapin's...dis 10&10 %
" Ohio Tool Co...dis 10 %
" Spear & Jackson's...5 50 to £ gold—new list
" Sandusky Tool Co...dis 10 %

Pliers.
Button's Patent...dis 33⅓ %

Plumbs and Levels.
Chapin's...dis 60&10 %
Standard Rule Co.'s New Adjustable...dis 50&10 %
Stanley Rule and Level Co...dis 60&10 %

Pumps.
Douglas Cistern, etc...new list dis 25 %
" S. & F...new list dis 20 %

Rakes.
Cast Steel...dis 30 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.
Malleable...dis 30 %
$5 50 6 00 6 50
11 13 15 teeth.

Razor Straps.
Genuine Emerson...dis 25 %
" " in 5 gross lots...dis 30 %
Hunt's...dis 35 %
Chapman...dis 10 @ 15 %

Rivets.
Iron and Tinned...dis 25 %
In bulk...list net
Copper Rivets and Burrs...new list dis 10 %

Rods.
Stair...new list dis 30 %
American Patent...dis 30 %

Rollers.
Barn Door...revised list dis 60&10 %

Rope. Manufacturers' List
Manila...½ inch and larger ₩ ℔ 17 c
" ...⅜ inch ₩ ℔ 17½c
" ...¼ and 5-16 inch ₩ ℔ 18 c
" Lath Yarn, Fine Tar'd...₩ ℔ 18 c
" Hay Rope...₩ ℔ 17½c
Sisal...½ inch and larger ₩ ℔ 14½c
" ...⅜ inch ₩ ℔ 15 c
" ...¼ and 5-16 inch ₩ ℔ 15½c
" Hay Rope...₩ ℔ 15 c

Rules.
Chapin's Boxwood...dis 60&10 %
" Ivory...dis 50&10 %
Hubbard & Curtiss Mfg. Co...new list net
Stanley Rule and Level Co.'s Ivory...dis 50&10 %
" " Boxwood...dis 60&10 %
Standard Rule Co.'s Boxwood...dis 60&10 %
" " " Ivory...dis 50&10 %

Sad Irons.
...₩ ℔ 4½c net
Sad Iron, Nickel Stand attached...₩ ℔ 9c

Sand Paper—dis 7½ @ 10 %
Beader & Adamson's (Flint) 00 to 1½...$4 25 ₩ ream
" " 2, 2½ & 3...4 75 "
Assorted...4 25 "
Star...₩ ream $3 25
Emery...₩ ream $6 50 @ 11 50
Cowdin Mfg. Co...dis 7½ @ 10 %
Diamond Flint, 00 to 1½...per ream $4 25
" " 2, 2½, 3 and assorted...4 75
" Emery Paper...per ream $6 50 to $11 50

Sash Locks.
Clark's...dis 20 %
Ferguson's...dis 20 @ 25 %
Norwich...dis 15 %
Walker's...list net

Sash Weights.
Solid Eyes...₩ ℔ 2½c

Sausage Fillers.
Perry's (P. S. & W.)...dis 10 %
No...1 0
₩ doz...$15 00 $21 00

Saw Rods...dis 10 %

Saws.
Spear & Jackson's...$4 50 to £ gold
John Spear...$3 60 to £ gold
Am. Saw Co...new list
Perforated Cross Cuts, all kinds...68c ₩ foot
Inserted Tooth...dis 10 %
All else...dis 12½ %
Disston's Circular...dis 20 %
" Mill...dis 25 %
" Cross Cut...dis 15 %
" other kinds...dis 12½ %
Livingston's Framed Wood...dis 5 %
H. W. Peace's Circulars...dis 10 %
" Other kinds...dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular...new list dis 10 %
E. M. Boynton's Lightning, dis 30&5 % for immediate cash
" Others...dis 15 %

Saw Sets.
Nash's...dis 20 %
Bemis'...dis 10 %
Aiken's Genuine...dis 25 %
Hotchkiss'...dis 10 %
Common Lever...per doz $1 80 net
Leach's...dis 15 %

Scales.
Turnbull's...dis 15 %
Brown's...dis 25&5
Fairbanks'...new list dis 15 @ 20 %
Howe's...dis 15&5 %
Shattuck's Counter and Union...dis 15 %
Chatillon's Grocers'...dis 25 %
Eureka...dis 25 %
Scale Beams...dis 25 %
No. 1 800 to 1200 lbs...90c ₩ cwt
No. 2 " "...75c ₩ cwt

Screws.
American list of Jan. 1, 1874.
Flat Head Iron...dis 52½ %
Round Head Iron...dis 50 %
Flat Head Brass...dis 52½ %
Round Head Brass...dis 50 %
Round Head Silver Capped...dis 25&10 %
Hand Rail...dis 33⅓ %
Coach or Lag...dis 30&10 @ 40 %
Coach, Patent Gimlet Point...dis 5 %
Bed...list net
English—Nettlefold & Chamberlain's Flat Head Iron...dis 52½&10 %
Machine—Flat Head, Iron...dis 60 %
" " " Brass...dis 10 %
Round Head, Iron...dis 55 %
" " Brass...net
Bench—Iron, Wilson's...dis 20 %
" —Wood...dis 15 %
Hand...dis 25&10 %
Jack—Bell Bottom...dis 15 %

Scythes.
Blood's German Steel, Grass...₩ doz $9 00
" Cast " "...₩ doz 10 00
" Silver " "...₩ doz 11 00
" German " Grain...₩ doz 13 00
" Cast " "...₩ doz 14 00
" Red Rover...12 00
" Young America...9 50
" Silver Clipper...12 63
Scythe Snaths...dis 20 %

Sieves.—Mann's Patent...dis 15 %

Shears.
Cast Steel...dis 60&10 %
Conn. Cutlery Co., new brand...dis 60 %
Rowe's...dis 50&10 %

Shovels and Spades.
Ames...new list dis 12½ %
Rowland...dis 20&5 %
Old Colony...new list dis 10&5 %
N. B. Sherman...new list dis 12½ %

Shovels and Tongs.
Iron Head...list net
Brass Head...dis 5 %
Polished Steel...new list dis 15 %

Slates.
Square Frames, Round Cornered, by case...dis 60&10 %
Less than a case...dis 50 @ 55 %
Oval Frames, by case...dis 40 @ 40&10 %
Less than a case...dis 30 %

Spoons.
Iron...new advanced list, dis 10 %
By the case...dis 20 %
Britannia...dis 40@40&10 %
Plated A 1...revised list dis 30&5 %
German Silver...revised list dis 15&5 %
Tinned (P. S. & W.)—
Teas...$1·50 ₩ gross, net
Tables...2·75 " net

Stocks and Dies.
...dis 15 %

Stove Polish.
Gem...₩ gross $5 00, dis 10 %
Joseph Dixon's...₩ gross, 6 00
Gold Medal...₩ gross $6 00, dis 15 %

Squares.
Steel...dis 50 % ; full cases, dis 50&10 %
Iron...dis 50 % ; full cases, dis 50&10 %
Nickel Plated...add $2 50 @ $4 00 ₩ doz net
Try Squares and T Bevels...dis 45&10 %
Star Try Squares and Bevels...dis 30 %

Tacks.
Full Weight American Iron...dis 40&7½ %
Half Weight American Iron...dis 70&7½ %
Carpet...dis 7½ %
Brads American Half Weight...dis 50&7½ %
Finishing Nails...⅜ ⅝ ¾ 1 1¼ in. and over
₩ ℔...25c 20c 18c 14c 13c dis 7½ %
Trunk and Clout...⅜ ⅝ ¾ 1 1¼ in. and over
₩ ℔...25c 20c 18c 14c 13c dis 7½ %
Copper Tacks...₩ ℔ 50c—dis 7½ %
Iron Shoe Nails, ₩ ℔ 4-8 and longer, 10c ; 3½-8, 10½c...dis 7½ %
Double Pointed...new list dis 33⅓ %

Tapes, Measuring.
American Flask and Cap Co...dis 20 %
Eddy's...dis 20 %

Thermometers.
Tin Case...dis 50 %

Toe Calks.
...₩ ℔ 18c net

Tobacco Cutters.
Champion...dis 20&10 %
Peck, Stow & Wilcox...dis 10 %

Tinners' Tools and Machines.
P. S. & W...list net

Traps.
Newhouse...dis 20 %
Hotchkiss...dis 20&10 %
Peck, Stow & Wilcox...dis 30 %
Blake's Patent...dis 15 @ 20 %

Trowels.
Lothrop's Brick and Plastering...dis 10 %
Disston's Plastering...dis 12½ %
Disston's Brick...dis 10 %
Rose's Brick...dis 5 %
Brades' Brick...gold, net
Worrall's Brick and Plastering...dis 15 %
Garden...dis 20 %

Vises.
Trenton Vises, Solid Box.
30 to 160 lbs...16c
160 and over...13c
Peter Wright's...₩ ℔ 15½c. gold
Wilson's Solid Box...dis 15 %
30 to 160 lbs...18c
160 and upward...22c
Wilson's Parallel...dis 30 %
Backus & Union, Parallel...dis 25 %
Buffalo, Parallel...new list dis 20 %
Fisher & Norris' Double Screw Parallel...dis 15 @ 15&5 %
Trenton Parallel...dis 15 %
Bonney's Saw Filers...dis 20 %

Wheel Barrows.
Pugsley & Chapman—Canal...dis 10&5 %
" Coal, Garden and Stone...dis 10 %

Wheel Heads.
Brass Bushed...per doz $3 25 net

Well Wheels.
Revised list...dis 55&10 %

Wire.
Bright and Annealed...Nos. 0 @ 18 dis 35 @ 40 %
" " ...19 @ 26 dis 45 @ 50 %
" " ...27 @ 36 dis 50 @ 55 %
Coppered...0 @ 18 dis 25 @ 30 %
Galvanized, Nos. 0 to 12...dis 40 @ 45 %
Galvanized, Nos. 13 to 18...dis 45 @ 50 %
Tinned...dis 20 @ 25 %
Cast Steel...5 @ 10 %
Tinned Broom Wire...dis 25 @ 30 %
Galvanized Telegraph, Nos. 8 and 9...₩ ℔ 9½c @ 10½c
" " 10 and 11...₩ ℔ 10½c @ 11½c
" " 12...₩ ℔ 11c @ 12c
Annealed Fence, Nos. 8 and 9...dis 35 @ 40 %
" Grape, " 10 to 14...dis 35 @ 40 %
Fence Staples...₩ ℔ 8½ @ 9c
Stubs' Steel Wire...$7 00 to £ gold

Wrenches.
American Adjustable...dis 45 %
Baxter's Adjustable "S"...dis 25 %
" Diagonal...dis 25 %
Collins & Co.'s...dis 25 %
Coes' Genuine...dis 40&5 %
" Pattern (Wrought)...dis 50 %
" (Malleable)...dis 50 %
Lindsay's Patent...dis 25 %
Taft's Pattern...dis 25 %
Davis' Patent Duplex...new list dis 25 %
Bemis & Call's Patent Combination...dis 20&5 %

Wringers.
Universal—Extra...₩ doz $68 00
Novelty...₩ doz 68 00
Sherman...₩ doz 68 00
Reliance...₩ doz 68 00
Providence...₩ doz 68 00
Monitor...₩ doz 65 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE.

Basins.
Wash Basins, Handled, Plain Stamped...dis 25 %
Inch...10 11 11½
Per doz...$3·50 4·00 [illegible]
Wash Basins, Handled, Retinned...dis 25 %
Inch...10 11 11½
Per doz...$4·00 4·50 [illegible]
Wash Basins, with Feet, Plain Stamped...dis 25 %
Inch...10 11 11½ 13½
Per doz...$2·00 2·50 2·63 [illegible]
Wash Basins, with Feet, Retinned...dis 25 %
Inch...10 11 11½ 13½
Per doz...$3·00 3·50 4·00 [illegible]
Wash Basins, Stamped...dis 25 %
Inch...10 10½ 11
Per doz...$1·70 2·10 [illegible]
Inch Shallow...11
Per doz...$1·55 [illegible]
Wash Basins, Retinned...dis 25 %
Inch...10 10½ 11½
Per doz...$2·50 [illegible]
Inch Shallow...11
Per doz...$2·00 2·60

Covers.
Bucket...dis 10 %
1 pt. 1 qt. 2 3 4 6 8 10 12 qt.
Per gross...$2·25 3·00 4·00 4·50 5·75 7·75 8·75 9·25 15·00
Coffee Pot...dis 10 %
[illegible]
Per gross...$1·25 1·50 1·75 2·25 3·50
Pot...dis 10 %
[illegible]
Tea Kettle Breasts and Covers...dis 10 %
[illegible]
Dipper Bowls, Plain Stamped...dis 10 %
Pints...½ ¾ 1 1½ Quarts...1 2 3
Per doz...[illegible]
Dipper Bowls, Retinned...dis 10 %
Pints...½ ¾ 1 1½ Quarts...1 2 3
Per doz...·75 ·95 1·00 1·15 Per doz...1·30 1·55 1·80

Pans.
Dish Pans, Tinned...dis 25 %
[illegible]
Milk Pans, Plain Stamped...dis 10 %
[illegible]
Milk Pans, Retinned...dis 10 %
[illegible]
Pie Plates...dis 10 %
[illegible]

JAPANNED TIN WARE.

Cannisters, Common...dis 10 %
[illegible]
Cannisters, Hinged...dis 10 %
[illegible]
Candlesticks, Japanned...dis 10 %
[illegible]
Cake Boxes, Round...per nest, $3·25, dis 10 %
" Square...per nest, 4·25, dis 10 %
Chamber Pails, Japanned (Smith, Burns & Co.)...dis 10 %
[illegible]
Dust Pans, Corrugated...per gross, $22·00, dis 10 %
Box Graters...per gross, $4·00, dis 10 %
Molasses Cups...dis 10 %
[illegible]
Pepper Boxes Japanned...Small, $3·00 ; Large, $4·00
Toy Banks, House...dis 10 %
[illegible]
Toy Banks Gothic...dis 10 %
[illegible]
Toy Cups, Straight...dis 10 %
[illegible]
Toy Cups, Flaring, nests of (3)...per gross, $2·50, dis 10 %
Toy Pails, Covered...dis 10 %
[illegible]
Toy Rattles...per gross, $2·25, dis 10 %
Trunks, Wire Handled...per nest (5) $1·50, dis 10 %
Spittoons, Tin...per gross, No. 2, $30, No. 3, $27, dis 10 %

PLANISHED TIN WARE.

Planished Coffee Pots, Round...dis 25 @ 30 %
[illegible]
Planished Tea Pots, Round...dis 25 @ 30 %
[illegible]
Planished Tea Pots, Oval...dis 25 @ 30 %
[illegible]
Planished Pepper Boxes, No. 1...per doz., $1·52
Planished Flour Dredges, No. 3, $2·10 ; 4, $2·45 ₩ dozen.
Planished Round Coffee Biggins...dis 25 %
[illegible]
Planished Oval Coffee Biggins...dis 25 %
[illegible]
Planished Oval Chafing Dishes, Imperial Covers...dis 25 %
[illegible]
Planished Oval Chafing Dishes, Low Covers...dis 25 %
[illegible]
Planished Low Dish Covers...dis 25 %
[illegible]
Planished Imperial Dish Covers...dis 25 %
[illegible]
Planished Etnas, on Stands...dis 25 %
[illegible]
Planished Liquor Mixers...dis 25 %
[illegible]
Planished Oval Melon Molds...dis 25 %
[illegible]
Planished Oval Tumbler Warmers...dis 25 %
To fit 1, 2, 3, and 4 O. G. Urns...each, $2·50
Planished Oval O. G. Urns...dis 25 %
[illegible]
Planished Round Urns...dis 25 %
[illegible]
Planished Round Oyster Dishes, (Complete)...dis 25 %
[illegible]
Planished Oyster Dish Plates...dis 25 %
[illegible]
Oyster Dish Covers...dis 25 %
[illegible]

Tea Pot Handles—P. S. & W...dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small, 4½ inches...per gross, $11·50
No. 2, Medium, 5½ "...[illegible]
No. 3, Large, 6½ "...[illegible]
No. 4, Ex. Large, 7½ in., for Wash Pitchers, &c...18·00
Stow's Patent. New Pattern.
No. 25, Small, 4½ inches...per gross, $11·50
No. 35, Medium, 5½ "...[illegible]
No. 45, Large, 6½ "...[illegible]
Solid Iron, Tin Tipped.
No. 10, Small, 4½ inches...per gross, $9·00
No. 15, Medium, 5½ "...[illegible]
No. 20, Large, 6½ "...[illegible]
Stow's Patent Hollow Tea Pot Handles, Adamantine

Bronze—P. S. & W.
No. 12, Bronzed and Tin-Tipped.....per gross, $13·50
Saucepan Handles, Of Best Malleable Iron.
P. S. & W.....dis 20 %
Japanned.
No. 1, 5¼ inches long.....per gross, $3·50
No. 2, 6 " ..... " 3·75
No. 3, 6¼ " ..... " 4·00
No. 4, 7¼ " ..... " 4·25
No. 5, 8 " ..... " 4·50
No. 6, 9 " ..... " 4·75
Tinned.
No. 1, 5¼ inches long.....per gross, $4·25
No. 2, 6 " ..... " 4·50
No. 3, 6¼ " ..... " 4·75
No. 4, 7¼ " ..... " 5·25
No. 5, 8 " ..... " 5·50
No. 6, 9 " ..... " 5·75
Japanned.....per lb., 18
Tinned..... " 20
Iron Kettle Ears (P., S. & W.).....dis 45 %
Half gross pairs in a package.

METALS.

IRON.—DUTY: Bars, 1 to 1¼ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1¾ cents per lb. Provided, that none of the above iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1¼ cents per lb.

Pig Iron—AMERICAN.
Foundry No. 1.....₩ ton, $34 00 @ 35 00
Foundry No. 2..... " 30 00 @ 33 00
Gray Forge..... " 27 00 @ 30 00
White and Mottled.....
SCOTCH.
Coltness..... " 39 00 @ 39 50
Glengarnock..... " 37 00 @ 38 00
Eglinton..... " 35 50 @ 36 00

Bar Iron.
Am. Rehned, at mill.....₩ lb 3c @ 3·2c

Rails:
Welsh, gold.....₩ ton, 54 00 @ 58 00
American, at works, currency..... " 60 00
Old Rails, T, currency..... " 38 00 @ 39 00

Scrap.
Wrought Scrap, from yard..... " 40 00

Bar Iron from Store.
Common Iron.
¾ to 2 in. round and square.....₩ ton, $ 70 00
⅝x9-16 in " " ..... " 75 00
¼ in. " " ..... " 77 50
2½ to 3 in. " ..... " 75 00
1 to 6 in. wide x ⅜ and 1 in. thick..... " 70 00
1¼ to 6 in wide x ¼ & 5-16 in. thick..... " 75 00
1 and 1¼ in. x ¼ and 5-16..... " 82 50
Swedish Iron.
1¼x¼ and ½..... " 170 00
1¾x¾ to ⅝, and ¾ square..... " 165 00
1¾ to 5x⅜ to ½ and ⅝ to 2-in. square..... " 160 00
6 to 8x⅜ and ½..... " 170 00
Refined Iron.
¾ to 2 in. round and square..... " 72 50
1 to 6 in. wide x ⅜ to 1 thick..... " 72 50
1¼ to 6 in wide x ¼ and 5-16 thick..... " 77 50
1 and 1¼ x ¼ and 5-16..... " 77 50
Large Rounds.
2¾ t › 2¾, round and square..... " 80 00
3, 3¼ and 3½ in..... " 85 00
3¾ and 4 in..... " 92 50
Rods—⅜ and 11-16, round and square..... " 77 50
½ and 9-16, " " ..... " 80 00
7-16, " " ..... " 85 00
⅝, " " ..... " 90 00
5-16, " " ..... " 95 00
¾, " " ..... " 100 00
13-16, " " ..... " 127 50
Band Iron.
1 to 6 in. x 3-16 to No. 12..... " 93 50
Horse Shoe Iron.
⅜ and ½ x ⅜, to ½..... " } 107 50
1 x ⅜, to ⅝.....
Ovals, Half Ovals and Half Rounds.
⅜ to 1⅜.....₩ ton, $ 97 50
⅝ and 11-16..... " 102 50
½ and 9-16..... " 107 50
7-16..... "
⅜..... "
Nail Rods
Best Norway.....₩ lb 8½ @ 9c
Norway Shapes
¼ to 2 in. x ⅛ to ⅜.....₩ lb } 8½c
¼ to ⅜ square..... " }
Norway Bar
¾ to 2 in. square.....
Spring Steel
1 to in. wide..... " 7½c
Tire Steel
⅜ to 1½ x ¼ and 5-16..... " 8½c
⅜ & 1 x 3-16..... " } 9½c
½ & 1 x ½..... " }
Toe Calk Steel
½ to ¾ x ⅜ to ½..... " 7½c
Plow Steel
6 to 16 wide..... " 8½c
Sleigh Shoe Steel
⅜ to 1½ x ⅜ to ½..... 6½c
Hoops, ⅜ x No. 22.....₩ ton $160 00
" ⅜ x No. 20..... " 130 00
" ⅜ x No. 19..... " 125 00
" 1 and 1¼ x No. 18..... " 115 00
" 1¼ to 2 and 1x1¼ x No. 13 and 14..... " 105 00
Scroll Iron—¼ x 12..... " 132 50
" ¼ x 10..... " 122 50
" ¼ x 3-16..... " 127 50
" ⅜ x ¼..... " 122 50
" ⅜ x 14..... " 132 50
" ⅜ x 12..... " 120 00
" ⅜ x 10..... " 117 50
" ⅜ x 5-16..... " 115 00
" ⅜ x ¼..... " 112 50
" ½ x 12..... " 115 00
" ½ x 10..... " 112 50
" ½ x 3-16..... " 110 00
" ½ x ¼..... " 107 50
" ⅝ x 14..... " 110 00
" ⅝ x 12..... " 107 50
" ⅝ x 10..... " 105 00
" ⅝ x 5-16..... " 102 50
" ⅝ x ¼..... " 120 00
" ¾ x 14.....

Sheet Iron.

	Common English.	R. G. American.	R. G. English.
Nos. 10 to 20.....₩ ₤	4½ @ 4¾c	5¼c	6c
21 to 24..... "	5 @ 5¼c	6c	6¼c
25 to 26..... "	5¼c	6¼c	6½c
27..... "	5¾c	6¾c	7c
28..... "	6c	7c	7¼c
30..... "	7¼c		
Galvanized, 18 to 20, prime.....₩ ₤			10¼c
" 21 to 24..... "			11½c
" 25 to 26..... "			12½c
" 27..... "			13½c
Patent Polished..... "			15 @ 16c
Russia, Nos. 8 to ..... ₩ ₤			19c
" Nos. 12 to 16 "			19c
" Stained, No. 1..... "			17½c
Belgian..... "			12c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON

4¼	5	5¼	6	7 inch.
$3·75	4·25	5·25	5·25	6·50 per doz.

RUSSIA IRON.

4¼	5	5¼	6	7 inch.
$8·00	9·00	10·00	10·00	14·00 per doz.

Adjustable Stove Pipe Elbows.

CHARCOAL IRON.

4	4¼	5	5¼	6	7 inch.
$3·25	3·75	4·25	4·75	5·25	6·25 per doz.

RUSSIA IRON.

4	4¼	5	5¼	6	7 inch.
$7·00	8·00	9·50	10·75	11·75	13·75 per doz.

Discount on orders of 10 doz. 5 %.
" " " 25 doz. 10 %.

Brass.
ROLLED AND IN SHEETS.
(Brown & Sharp's Gauge.*)
For the purchase of 100 pounds and over at one time
HIGH BRASS.
All Nos. to No. 28, and widths 14 in. and under.....34c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in. inclusive.....37c
Over 20 in. to 30 in. inclusive.....40c
½c ₩ ₤ advance on each No. above No. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass at.....38c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths.....40c
Printers' Rules.....44c
Sheets wider than 30 in. and under 40 in.....44c
" 40 in. and over.....46c
Circular sheets, in diam. from 4 in. to 14 inclusive....44c
" " " over 14 in. to 20 " 47c
" " " " 20 in. to 30 " 50c
" " " " 30 in. to 40 " 53c
" " " " 40 in.....56c
Brass Rods above No. 0, and under 1 in.....43c
" " 1 in. and over.....47c
LOW BRASS.
4c ₩ ₤ more than High Brass.
Gilding Metals, 7c ₩ ₤ more than High Brass.
Platers' or Gold Metal } In Bars..... 46c
" } Sawed..... 49c
FOR SLITTING: Metal in Width.
2in. to ¼ in., to No. 30, inclusive, 1c ₩ ₤ advance.
2in. to 1 in., thinner than No. 30, 2c ₩ ₤ advance.
2 in. to ¼ in., " " 30, 3c " "
¼ in. and less to No. 30, 2c ₩ ₤ advance.
¼ in. and less thinner than No. 30, 5c ₩ ₤ advance.
10 % discount.
SCRAP—NEW METAL.
High Brass Scrap, 17 cents, net.
Low " 19 " "
Gilding, 21 cents, net.
Turnings, Fillings and Chips, half the price of Scrap net
BRASS AND COPPER WIRE.
(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20.....	37	41	47
Nos. 21, 22, 23.....	38	42	48
Nos. 24 and 25.....	39	43	49

Brass Wire straightened and cut, 4 cents advance
10 % discount
FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 26.....	0·41	0·45	0·51
No. 27.....	0·44	0·48	0·54
No. 28.....	0·46	0·50	0·56
No. 29.....	0·48	0·52	0·58
No. 30.....	0·50	0·54	0·62
No. 31.....	0·53	0·56	0·66
No. 32.....	0·56	0·60	0·71
No. 33.....	0·60	0·64	0·81
No. 34.....	0·64	0·68	0·91
No. 35.....	0·69	0·73	1·03
No. 36.....	0·78	0·82	1·15
No. 37.....	0·98	0·98	1·28
No. 38.....	1·28	1·28	1·58

Ten cents per pound extra for Spooling.
TUBING.
(Brown & Sharpe's Gauge.)
₩ ₤
Plain to No. 20, inclusive.....$0·52
Nos. 21, 22, 23, 2c. advance on List for each No.
Nos. 24, 25, 26, 4c. " " "
Above No. 26 special rates.
Plain Tube, 1-4 inch.....68
" 3-16 " 1 33
" 1-8 " 1 75
All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20.....61
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet. 10 % discount.
BRASS DOOR RAIL—48 cents per lb.—10 % dis.
BELT AND HOSE COPPER RIVETS AND BURS.
Price per ₤.....40 50 52 54 56 58 60 64 68c
Nos.....7 8 9 10 11 12 13 14 15
Braziers Rivets, 43 cents per pound discount 10 %.
GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent. 12 inch. to No. 26.....	0·75	0·90
6 " " "	0·95	1·00
10 " " "	1·05	1·25
13 " " "	1·30	1·55
14 " " "	1·45	1·75
20 " " "	1·55	

Discount 10 %.
German Silver Sheets over 12 inches wide and weighing more than 10 lbs.....₩10 ₩ ₤ net
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Fillings and Chips, half the price of Scrap.
* Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Gauge.
COPPER—DUTY: Pig, Bar and Ingot, 5c.; old copper, 4 cents ₩ ₤; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.
American Ingot.....₩ ₤ 26 @ 26½c
English " .....
SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot.....35c ₩ ₤
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....28c. "
Braziers Copper, 12 oz. per square foot and lighter.41c. "
Circles less than 24 inch in diameter.....38c. ₩ ₤
Circles, 24 inch diameter and over.....41c. "
Segment and Pattern Sheets.....38c. "
Locomotive Fire Box Sheets.....35c. "
Sheathing Copper, over 12 oz. per sq. ft.....33c. "
" 12 oz. ₩ sq. ft. and lighter....41c. "
Bolt Copper.....35c. "
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.
TINNING.
14x48, by the case..... 8c. ₩ sheet
14x48, less than case.....10c. "
Boiler Sizes, 7 and 8 inch.....12c. "
" 9 inch.....15c. "
Other sizes not larger than 30x60.....2½c. ₩ sq.
Larger than 30x60..... 5c. "
Copper Bottoms 34 @ 36c. ₩ ₤.....net
O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier.....39c. By the case, 38c. ₩ ₤
12 oz. and lighter..... 42c. " " 41c. "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier.....41c. By the case, 40c. ₩ ₤
(And all sizes not over 20 inches wide.)
30x60
14 and 16 oz. and heavier.....43c. ₩ ₤
12 oz. 46c. "
LEAD—DUTY: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.: Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.
Spanish.....6½ @ 6¾c gold
German Refined.....6½ @ 6¾c gold
English.....6¾ @ 7c gold
American.....6¾ @ 6¾c gold
Bar.....dis 10 %.....8½c.
Pipe.....dis 10 %.....9c.
Tin Lined Pipe.....dis 10 %.....16½c.
Sheet.....dis 10 %.....9c.
Shot.....dis 10 %. Drop, 9c.: Buck, 9½c.
Solder.....No. 1, 16 @ 17c: No. 2, 15c
STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2½ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.
Tool.....16c
Spring.....12½c
Homogeneous.....12½c
Tire.....12½ @ 13½c
Machinery (round and square).....11½ @ 12c
File.....12½c
Sheet.....14 @ 16c
Saw Plate, mill and mulay.....14 @ 16½c
Saw Plate, gang and X cut.....13 @ 14c
" circular as to size.....13 @ 30c

Chrome Steel.
Tool.....₩ ₤ 20 @ 21c
Tool, extra fine..... " 40 @ 75c
Spring.....₩ ₤ 12c and upward
Machinery.....₩ ₤ 14c.
Hammer..... " 15c.
Gun or Homogeneous..... " 16c
English Steel,—payable in gold, dis 5 % cash.
Best Cast.....₩ ₤ 18c
Extra Cast..... " 19c
Round Machinery, Cast..... " 11½c
Swaged, Cast..... " 18c
Best Double Shear..... " 18c
Blister, 1st quality..... " 13½c
" 2d quality..... " 11½c
" 3d quality..... " 9½c
German Steel, Best..... " 11½c
do 2d quality..... " 10½c
Sheet Cast Steel, 1st quality..... " 18c
" " 2d quality..... " 16c
" " 3d quality..... " 14c
File Steel, Flat and ½ Round..... " 12½c
" Square and Round..... " 18c
" Mill..... " 13½c
" Taper to Inch..... " 16c
" Taper 3 and 3½ inch..... " 18c
SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.
Silesian, cash.....6¾ @ 7c, gold
American " .....7¾ @ 11c., currency
TIN—DUTY: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.; Electro-galvanized Plates, 2 cents per ₤; Manufactures of, not enumerated, 35 per cent. ad val. —all subject to a reduction of 10 per cent. Bars, Blocks and Pigs, free. Banca, subject to duty of 10 per cent.
Banca.....₩ ₤ 28c. gold
Straits.....₩ ₤ 26½ @ 27c, gold
English.....₩ ₤ 23 @ 24c., gold
CHARCOAL TIN PLATE.
I C 10x14, Prime Charcoal..... 12·00 @ 12·25
12x12, " ..... 12·75
14x20, " ..... 13·00
I X 10x14, " ..... 14·50
12x12, " ..... 15·00
14x20, " ..... 15·50
D C 12½x17, " ..... 11·75
D X 12½x17 " ..... 14·50
For each additional X add..... 2·25
COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14.....	$11·25 @ 11·50	10·25 @ 10·50	9·25 @ 9·75
I C 12x12.....	11·75	11·00	
I C 14x20.....	12·00	11·00	

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20....$11·00 @ 11·25		10·00 @ 10·75	7·25 @ 9·75
I X 14x20....	13·75		
I C 20x28....	23·75	21·50 @ 23·25	19·00 @ 21·50
I X 20x28....	26·50	27·50	
I C 20x220 ft.	25·00		

ZINC.—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2½c. ₩ ₤. All subject to a reduction of 10 per cent.
Sheet.....cask 9½c
"....Open 10c

Paper Stock, Old Metals, &c.

(Dealers' Selling Prices.)

Canvas linen..... @ 6½
" cotton. No. 1..... @ 7
" " No. 2..... @ 4
White linen rags. No. 1..... @ 7¼
" " No. 2..... @ 5
Colored..... @ 2½
Mixed woolens..... @ 3
Soft woolens..... @ 6½
Gunny bagging..... @ 2
Jute Butts..... @ 2½
Kentucky bagging..... @ 2½
Book stock..... @ 4¼
Waste paper and scraps..... @ 3
Rope cuttings..... @ 3
Kentucky Bale rope..... @ 4½
Oakum junk, No. 1..... @ 5½
" No. 2..... @ 4½
Grass rope..... @ 4½
Tarred Shaking..... @ 3
White Collar Cuttings, all paper..... @ ..
" " " muslin lined..... @ ..
" Envelope " ..... @ ..
Hard White Shavings, No. 1..... @ ..
Soft " " No. 1..... @ ..
White Shavings, No. 2..... @ ..
Mixed Shavings, part white..... @ 4¾
Imperfections, No. 2, best folded sheets..... @ ..
" " 1, Heavy Stock..... @ ..
Book Stock, Mixed..... @ 4
" " No. 2, light..... @ 3
Prints..... @ 2
Pure Manilas..... @ 2¾
Bogus Manilas and Hardwares..... @ 1¾
Commons..... @ ..
Binders' Board Cuttings..... @ ..
Straw Board Cuttings..... @ 1¼

Old Metal.
Copper.....22 @ 23
Yellow metal.....16 @ 17
Brass.....16 @ 17
Heavy Composition.....19 @ 20
Old lead, solid..... 6¼
Tea lead..... 5½
Wrought iron.....1¾ @ 1¾
Sheet iron.....0¾ @ ..
Cast iron.....1 @ 1¼
Machinery iron.....1¼ @ 1¾
Zinc..... 5½
Pewter, No. 1.....23 @ 24
" No. 2.....10 @ 12
Spelter..... 7

Paints, Oils, etc.

Paints.
Black, lamp—Coach Painters.....₩ ₤ 20c
" " Ordinary.....
" Ivory Drop, fair.....15c
" " best.....26c
Black Paint, in oil.....kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best.....50 @ 75c
" " " in oil.....35 @ 65c
" Chinese, dry.....
" Ultamarine.....25 @ 30c
Brown, Spanish.....1¼c
" Van Dyke.....
Carmine, 40.....$12 00
Green, Chrome.....15 @ 23c
" " in oil.....18 @ 25c
" Paris.....good, 30c; best, 40c
" " in oil..... " 30c; " 45c
Mineral Paints.....1¼ @ 4c
Orange Mineral.....14½c
Red Lead, American.....9¼c
" " English.....10¼c
" Venetian (N. C.) dry.....2¾c
" " in oil.....asst'd cans, 11c; kegs, 8¾c
" Indian, dry.....10c
Rose Pink.....13c
Sienna, American, Raw.....4c
" Burnt.....4½c
" " in oil.....16 @ 20c
" Raw " .....15 @ 25c
Umber, Burnt.....4 @ 8c
" " in oil.....16 @ 21c
" Raw.....3½ @ 7½c
" " in oil.....16 @ 22c
Vermillion, Chinese.....$1 92
" English..... 1 87
" Trieste..... 1 65
" American, Common.....23c
White Lead, American, pure dry.....10½c
" " in oil.....11½c
White, Paris, English, prime.....in bbls. 2½ @ 2¾c
Yellow Ochre French.....2½ @ 2¾c
" in oil.....asst'd cans, 11c; kegs, 8½c
" Vermont.....In casks 1½c
" Chrome.....17 @ 21c
" in oil.....18 @ 22c
Zinc White, American No. 1 dry.....9c
" 1, in oil.....11c
" French (Paris).....11 c
" " in oil.....12
Oils.
Linseed Raw.....₩ gal. casks, 97c. bbls. 98c.
" Boiled..... " $1·02 " $1·03
Whale, Crude..... "
" Bleached Winter..... "
Sperm, Crude..... " 1·50
" Winter unbleached..... " 1·70
" Bleached..... " 1·75
Seal, Extra Refined..... "
Lard, Pure Winter..... " 82c
" Spring.....
Cotton Seed, Crude..... " 42½c
" Southern Yellow.....46½c @ 47½c
" White..... "
Neatsfoot, Winter.....70c @ $1·10
Natural Lubricating.....38c @ 40c
Sundries.
Asphaltum.....9c
Benzine.....₩ gal. 16c
Chalk.....1½c
" Block.....
Dryer, Patent, Am'n.....ass't cans, 10½c.; kegs 9c
" " English..... " 11c.; " 9c
Blocks.....
Frostings.....50c
Glue, White.....38 @ 47c
" Sheet.....30c
Glaziers' Points, Zinc.....9c
Gum, Copal.....36c
" Damar.....25c
" Shellac, English.....60c
" " dark.....50c
Litnarge.....10c
Pumice Stone, selected Lumps.....4 @ 6c
" powdered.....4c
Putty in bladders.....3½c
" in bulk.....3c
Rotton Stone, soft, English.....8c
Spirits Turpentine.....43c
Whiting, Spanish.....1c

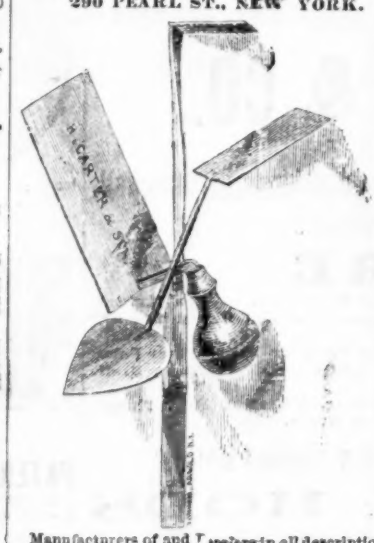
Glass.
French Windows—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.
SINGLE.

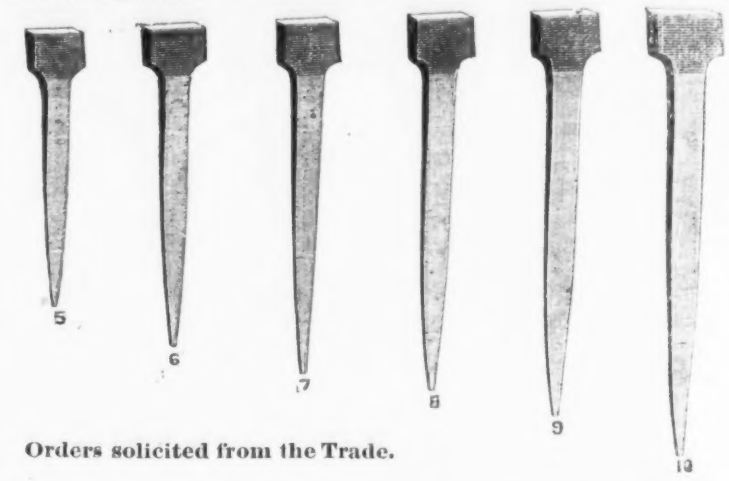
SIZES.	I.	II.	III.	
6 x 8 to 10 x 15	$10·25	$9·25	$8·75	$8·00
11 x 14 to 16 x 24	12·00	11·00	10·00	9·50
18 x 22 to 20 x 30	15·00	13·50	12·00	10·50
15 x 36 to 24 x 30	17·50	15·25	12·50	
26 x 28 to 24 x 36	18·25	16·00	13·25	
26 x 36 to 26 x 44	20·00	18·00	14·50	
26 x 46 to 30 x 50	21·00	19·00	15·25	
30 x 52 to 30 x 54	22·50	20·25	16·25	
30 x 56 to 34 x 56	24·50	21·75	19·00	
34 x 58 to 34 x 64	26·00	24·50	21·50	
36 x 60 to 40 x 60	30·50	27·00	24·50	

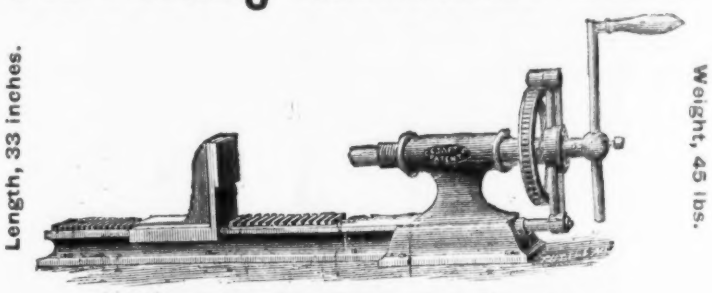
DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$16·50	$15·00	$14·00	$13·00
11 x 14 to 16 x 24	19·25	17·75	16·00	15·25
18 x 22 to 20 x 30	24·00	21·75	19·25	
15 x 36 to 24 x 30	28·00	24·50	20·00	
26 x 24 to 24 x 36	29·25	26·75	21·25	
26 x 36 to 26 x 44	32·00	29·00	23·25	
26 x 46 to 30 x 50	33·75	30·50	24·50	
30 x 52 to 30 x 54	36·00	32·50	26·00	
30 x 56 to 34 x 56	39·25	35·00	30·50	
34 x 58 to 34 x 60	41·75	39·25	34·75	
36 x 60 to 40 x 60	49·00	43·25	39·25	

Sizes above—$12·00 per box extra for every 5 inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.
Discounts 50 %, 10 % and 5 % to 60 %.







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S. P. PIERCE & CO	Syracuse, N. Y.
FARES & FISCHER	Cincinnati, O.
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Emery Wheels STROUDSBURG Emery Grinders MONROE Co. PA.

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Bemis & Call Hardware & Tool Co.'s

This Wrench can be furnished with Briggs Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout. And not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench. Thus making a Combination which has no equal.

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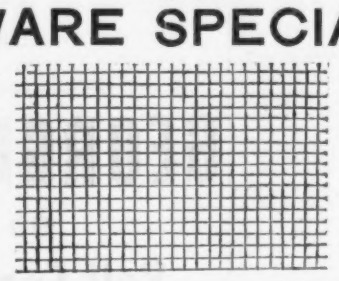

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WRENCHES,

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Our Mr. L. Coes, formerly senior member of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar *wider*, where the strain comes most severe, and screwing a nut up firmly against four *square* shoulders inside the ferrule, thereby *effectually* preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the market.

There are *Imitations* of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 10th, 1863 (re-issued June 1st, 1869), June 26th 1866, March 23d, 1869 (re-issued April 13th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped

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Oval, Square and Round Wash Boilers, Tea Kettles, Coffee Pots, Fluted, Octagon, Oval and Round Tea and Coffee Pots.

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Patent Corrugated Riveted Bottom

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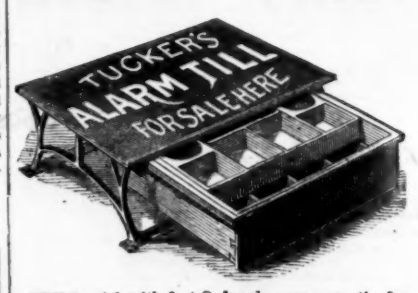

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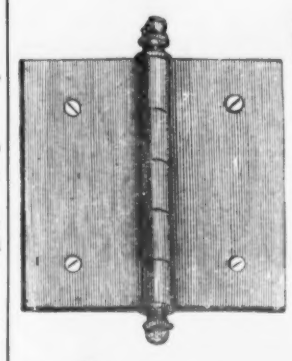

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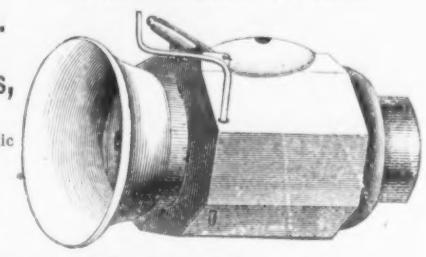

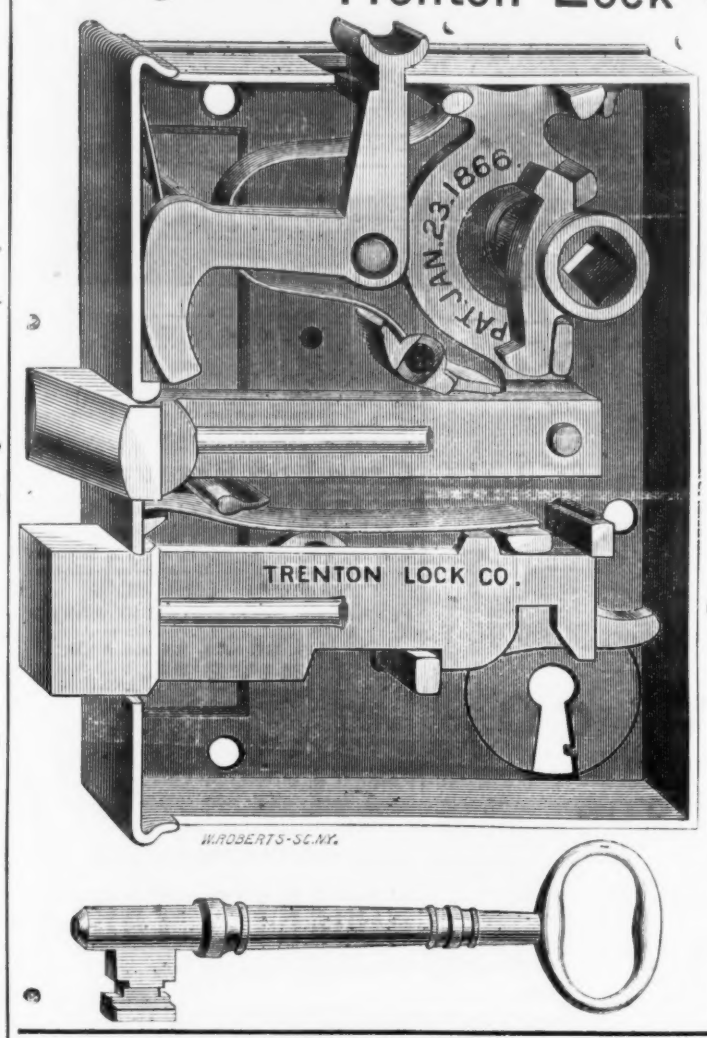

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Heavy Sash

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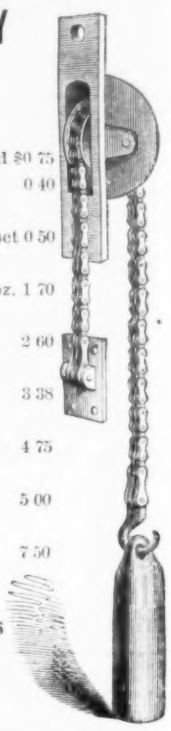
Square Groove Noiseless Pulleys, 2½ inch	"	2 60
Square Groove Noiseless Pulleys, 3 inch	"	3 38
Square Groove Noiseless Pulleys, 3½ inch	"	4 75
Square Groove Brass Face and Wheel Pulleys, 2 inch	"	5 00
Square Groove Brass Face and Wheel Pulleys, 2½ inch	"	7 50



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The tails of the Bolts and Latches, being of corrugated wrought iron, are stronger than those made in any other manner. The general finish of the goods is fully equal to the best in market.

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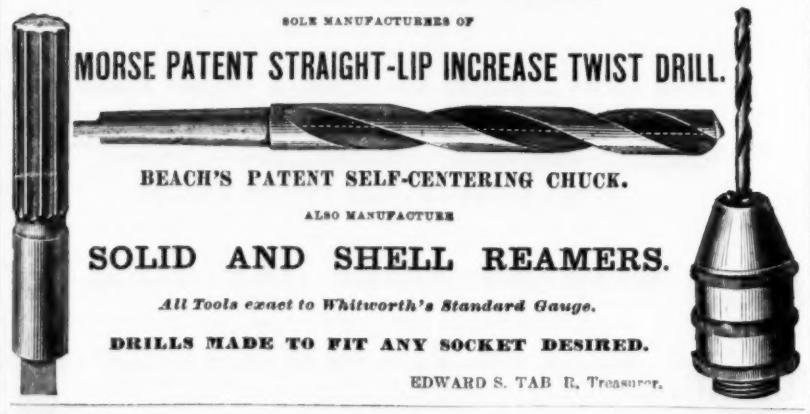

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SOLID AND SHELL REAMERS.

All Tools exact to Whitworth's Standard Gauge.

DRILLS MADE TO FIT ANY SOCKET DESIRED.

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His famous **SPERM SEWING MACHINE OIL** received the highest award at the Vienna Exposition.

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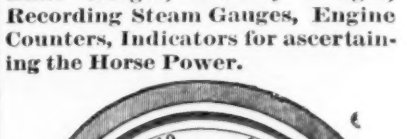
for BLAST FURNACES.

E. BROWN'S STANDARD PORTABLE,
E. Brown's Improved Gauntlet



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For Baker's Ovens, Boiler Flues, Galvanizing Baths, Oil Stills, Vulcanizers, Superheated Steam.

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Over 200 Gauntlets and 60 Portable Pyrometers are now in use at Blast Furnaces.

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Peter Wright's.....₱ ℔, gold, 12½c
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Apple Parers.—Reading Improved.....per doz $8 50
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Union, " ..... " 8 00
Turn Table, " ..... " 8 50
Discount for 25 dozen lots..... 50c
Axes.—Mann's Light.....Per doz. $13 00 @ 14 00
Hunt's Light..... " 14 00 @ 14 50
Red Indian, all sizes..... " 12 50 @ 12 00
Red Chieftain, all sizes..... " 12 50 @ 13 00
Crown Prince..... " 13 50 @ 13 00
Augers and Auger Bits.—Pierce's Pat. Twist Bits.....dis 25 @ 25&5 %
Bates' & Ives' Bits.....dis 30&10 %
Douglass' Bits.....dis 30&10 %
Cast Steel Bits.....dis 35&10 %
Cook's Bits.....dis 40 %
Bonner's Pat. Hollow Augers.....dis 25 %
Stearn's Patent Hollow Augers.....dis 25 %
Russell Jennings' Bits.....dis 10 %
Bates' & Ives' Nut Augers.....dis 30&10 %
Douglass Nut Augers.....dis 20&10 %
Watrous' Ship Augers.....dis 10 %
Balances.—Landers Frary & Clark's.....dis 15 %
Chatillon's.....dis 15 %
Morton's.....dis 15 %
Common Spring with Hook.....₱ doz $1 38 @ 2 00
Bells.—Bevin Bros. Mfg. Co. Light Hand Bells.....dis 30 @ 60&10 %
Other makers light.....dis 60 @ 60&10 %
Swiss Pattern Hand Bells.....dis 40 %
Connell's Door Bells.....dis 50 %
Great Western and Kentucky Cow.....dis 50&10 %
Boring Machines.—Bates' Mfg. Co., complete with augers.....dis 15 @ 20 %
Douglass' Mfg. Co., complete with augers..dis 15 @ 20 %
Common Boring Machines, no Augers.....$4 25 @ 4 00
Auguar, " " ..... 5 25 @ 5 00
Bolts.—Eastern Carriage Bolts.....dis 70&10 %
Western " " .....dis 70&10 %
Philadelphia " " .....dis 50 %
Wrought Snutter Bolts.....dis 45 @ 50 %
Cast " " .....dis 30&10 %
Skelly's Phila. Norway iron, finish. points.....dis 50 %
Braces.—Barber's.....dis 40 %
Backus.....dis 40&10 %
Bartholomew's American Ball.....dis 10&10 %
Spofford's.....dis 40 %
Butts.—Cast Fast Joint, Narrow.....dis 50 %
" " Broad.....dis 50 %
Cast Loose Joint.....dis 60 %
" Acorn, Loose Pin.....dis 40&10 %
Wrought Loose Pin.....dis 35 %
" Table Hinges and Back Flaps.....dis 30 %
" Narrow.....dis 30 %
" Loose Joint.....dis 35 %
" Reversible.....dis 35 %
Parker's Bling Butts.....} dis 50 %—dis by the case 50&5 %
Shepard's " " .....
Clark's " " .....
Cherrytree " " for wood.
Lull & Porter's " .....dis 25&10 %
Chains.—German Halter.....new gold list dis 10 %
" Coil.....new gold list dis 10 %
Galvanized Pump.....₱ ℔ 15c
Best Proof Coil Chain—
₱ ℔..... 13¾ 10¾ 10 9½ 9¼ 9 8¼c gold
5-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ in.
By the cask, 560 lbs., discount ½c per lb. Common Chain, ¼c per lb. less than proof.
Chisels.—Socket Framing.....dis 60 @ 60&10 %
Socket Firmer.....dis 60 @ 60&10 %
Tang " .....dis 40 @ 40&10 %
Beaver's Framing and Firmer.....dis 10 @ 15 %
Casters.—Porcelain Wheel.....dis 30&10 %
Iron.....dis 30&10 %
Brass.....dis 30&10 %
Clothes Wringers.—Universal.....per doz $72 00
Novelty..... " 72 00
Reliance..... " 72 00
Providence..... " 72 00
Orders for 5 dozen, discount $3 per dozen.
King Wringers (Iron Frame).....per doz $68 00
Coffee Mills.—Common Box and Side.....dis 10 @ 15 %
Patent Box and Side.....dis 10 @ 15 %
Cutlery.—American Pocket (best).....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co.'s..dis 60 @ 60&10 %
Concave Adjustable Handle.....dis 10 %
Beatty.....dis 10 @ 15 %
Fry Pans.
Tinned.....dis 30 %

₱ doz..	$3 00	3 25	3 62	4 00	4 50	5 00	5 50	6 00	7 50
No....	0	1	2	3	4	5	6	7	8

Burnished

₱ doz..	$2 80	3 00	3 38	3 75	4 12	4 50	5 00	5 62	6 75
No....	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.....new list, $5 00 to £ cur dis 10 %
" Bastard..... " 5 00 to £ cur dis 10 %
" Taper..... " 5 00 to £ cur dis 10 %
Butcher's Mill.....$5 75 to £ gold
" Bastard..... 5 50 to £ gold
Taper..... 5 50 to £ gold
Moss & Gamble—Mill, Taper and Bastard.....5 50 @ 5 25 to £ gold
Fluting Machines.
K. F. M.—4¼ in. rolls, $5 50.....dis 10 %
" —6 in. rolls, $6 65.....dis 10 %
Mrs Knox—4 in. rolls, $5 50.....dis 10 %
" —6 in. rolls, 6 65.....dis 10 %
Hammers.
Yerkes & Plumb's.....dis 10 %
Hammond & Son's.....dis 10 %
Verree.....dis 10 %
Hatchets.
Beatty's.....dis 10 @ 15 %
Shingling and Half. { ₱ doz.. $7 00 7 50 7 75 8 00 / No..... 1 2 3 }
Yerkes & Plumb.....dis 10 %
Shingling and Half. { ₱ doz.. $7 00 7 50 8 00 8 50 / No..... 1 2 3 4 }
Claw.... { ₱ doz..... $7 50 8 00 / No..... 1 2 3 }
Hinges.—Strap and T, advanced Feb. 6.....dis 25&7½ %
Bonney's No. 1 Gate.....dis 25 %
" No. 2 and 3.....dis 35 %
Horse Nails.

	Nos.	6	7	8	9	10
Ausable		27	25	24	23	22
Globe		28	26	25	24	23
Brundage		26	24	23	22	21
	Nos.	5	6	7	8	9	10
Putnam		32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 45 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 50 %
Scandinavian Pad Locks.

₱ doz.....	$10 50	10 50	12 00	12 00	15 00	15 00	} dis 15 %
No.....	9	9½	10	10½	11	11½	
₱ doz.....	$18 00		18 00		22 00	22 00	} dis 15 %
No.....	12		12½	13		13½	

Trunk Locks.....dis 5 @ 10 %
Thumb and Roggens Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
" " Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 60 @ 60&10 %
Lincoln's " .....dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum...dis 10 @ 10&10 %
Taylor's Petroleum Faucets.....dis 20 @ 20&10 %
Brass Liquor Cocks.....dis 20&10 %
Meat Cutters.—Dixon's.....dis 10 %
Woodruff.....dis 10 %
Stowe.....dis 10 %
Hale's.....dis 25 %
Stuffers.....dis 10 %
Planes.—Auburn Tool Co., "Bench".....dis 30&5 %
Second Quality.....dis 40 %
Metallic Plane Co.....dis 25&5 %
Evans Pat. Circular.....net
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks.—Philadelphia.....net
Pittsburgh.....net
Plumbs and Levels.
Stanley Rule and Level Co.....dis 60 @ 60&10 %
Wm. Johnson, (Stanley List).....dis 60 @ 60&10 %
Rakes.—Cast Steel Garden.....dis 33⅓ %
Malleable Garden.....dis 33⅓ %
Wood Head Iron Teeth.....dis 30 @ 40 %
Rules.—Stanley Rule and Level Co.....dis 60 @ 60&10 %
Steven's and Hubbard's.....dis 60 @ 60&10 %
Steelyards.—American Pattern.....dis 15 %

₱ doz.....	$5 50	7 00	9 00	10 00	11 00	12 00
No.....	50	100	150	200	250	300

English Pattern.....dis 15 %

₱ doz.....	$7 00	8 67	10 67	12 67	14 67	16 67
No.....	50	100	150	200	250	300

L. F. & C. Excelsior.....dis 10 %

₱ doz.....	$9 00	10 00	12 00	15 00	18 00	21 00
No.....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₱ doz. $11 00 net
Clipper No. 10, Boxed and Sharpened.....₱ doz $10 50
" " 5, " " " 10 00
Common Scythes.....₱ doz $7 00 @ 10 00
Squares.—Steel and Iron, new list.....dis 50 %
Saws.—Disston's Cross Cut.....dis 12½ %
Disston's Hand.....dis 12½ %
W. McNiece's H'd, Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list.....dis 30 %
Shovels and Spades.
Rowland's Plain Back, list Feb. 1873.....dis 20&10 %
" Back Strap " .....dis 20&10 %
Oliver Ames & Sons.....new list dis 12½ %
Brady Shovel Co.....dis 12½&5 %
Sad Irons.—Richmond (polished face), per lb. 4¾c. net
Coquanock (polished face)..... 4¾c. net
Stone.—Arkansas Oil, No. 1.....₱ ℔ $1 88
Turkey Oil, No. 1..... " 1 00
Washita Extra..... " 30c
" No. 1..... " 22c
" " 2..... " 18c
Hindostan 8 in..... " 5½c
" Axe..... " 7c
Screws.—Iron..... new list, Jan. 1st, 1874, dis 52½ %
Brass.....dis 52½ %
Spoons.—
Plated Spoons, Rogers Bros.'...new list dis 30 @ 30&5 %
Britannia Spoons.....dis 40 @ 40&5 %
German Silver.....new list dis 10 @ 15 %
" Light.....new list dis 15&5 %
Lalance & Grosjean Iron.....dis 10 %
Springs.—Gray's Door.....dis 40 %
Torry's Door.....dis 40 %
Stocks and Dies......dis 15 %
Stove Polish.—Gem.....₱ gross, $5 00
Onyx..... " $5 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 70 %
" " by the case.....dis 70&7½ %
Clout and Finishing Nails.....7½ %
" " " by the case.....dis 7½ %
Traps.—Genuine Oneida—Newhouse list.....dis 20 %
Imitation " " " .....dis 30 %
Vises.—Solid Box.....₱ ℔ net 15c
Wrenches.—Coes Genuine.....dis 40 %
Coes Imitation Wrought Bar.....dis 50 %
" " Malleable Bar.....dis 60 %
" " (Kellogg) Malleable Bar....dis 50 @ 10 %
Tafts Pattern (Wrought Bar).....65 %
" " Kellogg's (Nail Bar).....dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
" " " Improved Baxter.....dis 25 %
" " " Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....dis 37½ @ 40 %
No. 19 to 26.....dis 40 @ 42½ %
No. 27 to 36.....dis 45 @ 47½ %
Coppered 0 to 12.....dis 15 @ 20 %
Tinned Broom Wire.....dis 20 %
Galvanized Wire No. 0 to 18.....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

April 11, 1874.

Augers—C. S. Cut, French, Swift & Co.....dis 30&10 %
Bits, Auger—Pierce's.....dis 30 %
Snell Mfg. Co.....dis 20 %
Jennings.....dis 10 %
Bells, Cow—Haw's Genuine.....dis 25 %
Bolts—Carriage and Tire.....dis 25 %
Braces—Bit, Spofford's Patent.....dis 40 %
Brads, Cut.....dis 50&7½ %
Boards—Stove, Brooks' Patent.....dis 30 %
Butts—Brass.....dis 25 %
Cast Loose Joint.....dis 60 %
" " Pin.....dis 45 %
" " " Japanned.....dis 45 %
" " " Silver Tipped.....dis 25 %
Wrought Narrow.....dis 30 %
" Broad, Loose Joint.....dis 35 %
" Table and Back Flaps.....dis 30 %
Wrought Butts, Loose Pin.....dis 35 %
Belting—Rubber.....dis 30 @ 30&5 %
Leather new list.....dis 30 @ 30&5 %
Beaters, Egg, "Peerless".....per doz $4 00
Brick—Bath (box of 2 doz) Best English.....$1 50
"Rutherford".....$1 00
Chalk—White, Carpenter's.....₱ gross, 50c
Red, Carpenter's..... " 75c
Blue, " ..... " 90c
Chisels—Firmer Socket.....dis 60&10 %
Framing Socket.....dis 60&10 %
Corner Socket Chisels.....dis 60&10 %
Slick's Carpenters'.....dis 60&10 %
Castings—Malleable.....₱ ℔ 10½c
Cherry Seeders.....per doz $12 00
Elbows—Corrugated.....

	5	5½	6	7	
Charcoal	$4 25	5 25	5 25	6 50	} dis 10 %
Russia	10 00	13 00	13 00	14 00	

Files—Maischoss Bros.....dis 50 %
Freezers Ice Cream—"Champion".....dis 33⅓ %
Hinges—Window Blind—
Clark's No. 20.....55&10 %
Shepard's Standard, and Clark's.....dis 50 %
Wrought Strap and T.....dis 55&7½ %
Hods, Coal—Plain, Black and Galvanized.....dis 10 %
Funnel, Black and Galvanized.....dis 10 %
Fancy and Helmet.....dis 10 %
Palace Coal Vases.....dis 10 %
Hooks and Staples—Wrought.....net
Hooks—Belt.....dis 60&10 %
Hasps and Staples—Wrought.....dis 50 %
Sad Irons.....dis 60&10 %
Kettles—Brass.....₱ ℔ 50 @ 55c
Enameled.....dis 45 %
Knives, Drawing—Oval No. 1.....dis 60&10 %
Razor Blade.....dis 50&10 %
Lanterns "Peerless,"....No. 1 5 10
₱ doz $26 00 $11 25 $13 75 dis 10 %
Gem, with guards.....$6 50
Tubular.....11 50
" with Guards.....12 00
Machines—Apple Paring, "Turn Table".....8 50 ₱ doz
Mills, Coffee—Box and Slide, common.....dis 10 %
Box Union and Eagle.....dis 10 %
"American.....dis 20 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Horse, Ausable.....No. 5 6 7 8 9 10
20 27 25 24 23 22c
" " Finished & Pointed.....add 1c ₱ ℔
" " 1000 lbs.....dis 5 %
" Clinton.....No. 6 7 8 9 10
22 20 19 18 17c
Packing—Rubber.....dis 30 @ 30&5 %
Pencils, Slate—Soapstone.....4 5 6in.
30 40 50c. ₱ 100
Case lots.....dis 20 %
Paint—White Lead, U. S. Gov't.....₱ ℔ 9 c
Rivets—Iron, Black and Tinned.....dis 20 @ 25 %
Copper.....dis 10 %
Rope—Manila, ¼ inch and larger.....₱ ℔ 16½c
Rules—Boxwood and Ivory, Stephens.....dis 60 %
Screws—"American Screw Co"—
Flat Head, Iron.....dis 52½ %
Flat Head, Brass.....dis 52½ %
Staples—Blind, Boardman's Pat., ½ & ⅝.....₱ ℔ 37c
Spoons, Iron Tinned.....dis 10 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 30&5 %
Britannia.....dis 40 %
Squares—Steel and Iron.....new list 50 %
Shoes, Horse—H. Burden & Sons.....₱ keg $6 00
Shovels & Spades—Shepard, Forsyth & Dennison..dis 20 %
Saws—Henry Disston & Sons.....dis 10 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Shears—Seymour's.....dis 60 %
Traps, Steel—Newhouse.....dis 20 %
Tacks—Half Weight Am. Iron.....dis 70&7½ %
Vises—Parallel, Buffalo.....dis 20 %
Wrenches—Coes' genuine.....dis 40 %
Coes' Imitation.....dis 50&10 %
Tafts' Pattern.....dis 65&10 %
Ware—French, Tinned and Iron.....dis 30
Stamped and Japanned.....net
Cast Iron Hollow.....dis 30 %
Tin Plates.—Add for each X.....2 50
10x11, I.C. Charcoal...$12 50 | 14x20 I. terne...11 50 @ 11 75
12x12, " ... 13 00 | 20x28 C. " ... 25 00
12½x17, " ... 12 50 | 20x28 X. " ... 29 25
14x20, " ... 13 50
Pig Tin—Straits.....33c @ 34c
Bar Tin.....35c
Solder.....No. 1, 19c; No. 2, 17c
Sheet Zinc—
"Lasalle".....570 ℔ casks
$10 00 10 50 ₱ 100 ℔
Sheets.....$10 00
Iron Wire—Bright and Annealed.....dis 35 %
Coppered.....dis 30 %
Tinned.....dis 15 %

Tinned Broom,	Nos. 20	21	22	} dis 20 %
	20c	21c	21c	

Copper—Sheathing 14 @ 18 oz.....₱ ℔ 33c
Planished.....₱ ℔ 39 @ 41c
Bottoms.....₱ ℔ 35c
Bolts.....₱ ℔ 35c
Braziers' Sheets.....₱ ℔ 37c
Sheet Iron.—
18 Common.....$5 10
24 Common.....5 30
24 W. D. Wood & Co., Smooth Finish.....6 10
Am. Russia.....A. B.
14½c 11c
Gen. Russia, No. 1 stained.....20c
" " clean.....21c
Galvanized.....dis 15 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal.....$12 00 @ 14 00
I. X. 10x14 Charcoal.....15 50 @ 17 00
I. C. Terne 14x20.....11 00 @ 13 50
I. C. Terne 20x28.....24 00 @ 25 00
I. C. Continuous.....28 00
Block Tin.—
Pigs.....37½c @ 38c
Bars.....₱ ℔ 39c
Solder.—
S. & Co.....₱ ℔ 28c
A 1.....₱ ℔ 24c
Roofing " 23c
Lead.—Pig.....₱ ℔ 7¼c @ 8c.
Bar.....₱ ℔ 8c @ 9c
Copper.—
Ingot.....₱ ℔ —
Planished..... " @ 40c
Sheathing..... " @ 35c
Copper Drops 37c @ 38c
Sheets, 6 to 9 ℔...₱ ℔ 41c
" 10 to 12 oz... " 38c
Braziers 18 lb..... 35c
Copper Bottoms..... —
Zinc. Casks, 300 to 1000 lbs.....₱ ℔ 11 c
Case, 100 lbs..... " 11½c
Slab..... " 8½c @ 9c
Brass.—
Roll, No. 6 to 30.₱ ℔ 45c
" 30 to 38. " 65c
Roll, No. 38 to 40...₱ ℔ 50c
Wire, No. 0 to 20...₱ ℔ 50c
" 20 to 25... " 60c
Babbit Metal.—
Sellew & Co.....₱ ℔ 25c
Black Lead.....₱ ℔ 25c
Market..... 18c
Antimony.....₱ ℔ 20c
Bismuth.....₱ ℔ $6 00
Nickel.....₱ ℔ $3 50
Sheet Iron.—Russia.....₱ ℔ 20c @ 22c

	Com. B.	Fin. S. L. U.	Smooth D Re'fd.
Am Russia A..₱ ℔		14 @ 15c	
" " B.. "		13 @ 14c	
18 to 20	6·0c	7·5c	9·0c
22 to 24	6·2c	7·8c	9·2c
26	6·4c	8·0c	9·4c
27	6·6c	8·2c	9·6c

Galvanized Iron.—Full bundles.....dis 25 %

Nos. 18 to 20	15c	No. 27	18c
22 to 24	16c	28	20c
25 to 26	17c		

Bar Steel.—Silver, ₱ ℔ 21c; Crescent, 17¼c.
Iron Wire.....dis 25 %
Enameled Ware.....dis 33⅓ %
One Piece Corrugated Elbows.....dis 10 %
Iron Gas Pipe.....dis 65 %

Charcoal Iron.		Russia Iron.	
4⅓ inch	₱ doz $3 75	4⅓ inch	₱ doz $8 00
5 "	4 25	5 "	10 00
5½ "	5 25	5½ "	13 00
6 "	5 25	6 "	13 00
7 "	6 50	7 "	14 00

Lender Elbows—Flat Crimp Retinued.—

	₱ doz.		₱ doz.
2-inch	$2 00	2½-inch	$2 25
3-inch	2 50	3½-inch	3 00
4-inch	3 50	4½-inch	4 00

Sheet Iron Bridd Pans.....₱ ℔ 12c
American Broilers.....₱ doz, $13 50
Tinmen's Machines.....net list
Sad Irons.....₱ ℔, 5½c
Brass Kettles.—Ansonia.....48c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips:

Iron, standard list, assorted sizes, for large orders, 3c, card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4·7c ₱ ℔ net
Iron Wedges.....4¾c ₱ ℔ net
Norway Nail Rods.....9½c ₱ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point).....5½c ₱ ℔ net
Beetle Rings.....9¼c ₱ ℔ net
Fence Pickets—
⅝ round, bent to shape 30c ₱ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts (new list).....70&5 % off net
Plow Bolts.....30&10 % off net
Stove Bolts.....10 % off net
Machine and Square Head Bolts.....30&5 % off net
Coach and Lag Screws.....30&5 % off net
Bolt Ends.....30 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅜ in.....7 c ₱ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....5½c ₱ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in.....8 c ₱ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1½ in.....6 c ₱ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ₱ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ₱ ℔ ex.
Nuts and Washers in 5 lb. boxes, 1½c. ₱ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¼c ₱ ℔ net; ⅞ & 1 in. diam. 3¼c ₱ ℔ net; ¾ in. diam. 4¼c ₱ ℔ net.
Patent Headed Harrow Teeth, packed in casks, 4½c ₱ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 6c ₱ ℔ net; 9-16 in. diam. 7c ₱ ℔ net; ½ in. diam. 8c ₱ ℔ net. 1c ₱ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ⅜ to 1 in. diam. 9c ₱ ℔ net; ⅝ in. diam. 10c ₱ ℔ net; ½ in. diam. 12 c ₱ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to 6 in. long, 5½c ₱ ℔ net; 8, 10 & 12 in. long, 7c ₱ ℔ net.
Strap and T Hinges, 25 & 5½ % off net, delivery as customary.
Screw Hitching Rings.....$5 50 ₱ 100 net
Dog & Nest Tuyere Irons.....$15 00 ₱ doz net
Cast Iron Washers.....₱ ℔ 4½c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long.....₱ ℔ 4½c net
1 to 2 in. diam. from 4 to 8 ft. long..... " 4½c net
1 to 2 in. diam. from 1½ to 4 ft. long..... " 5c net
⅞, ¾ and ⅝ in. diam. over 4 ft. long..... " 5½c net
⅞, ¾ and ⅝ in. diam. from 1½ to 4 ft. long " 5½c net

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at Screw End, ₱ set of 8 bolts.. 55c
12 " ½ " " 8 " .. 70c
10 " 9-16 " " 8 " .. } 90c
12 " 9-16 " " 8 " ..
14 " 9-16 " " 8 " .. $1 00
10 " ⅝ " " 8 " .. } 1 00
12 " ⅝ " " 8 " ..
14 " ⅝ " " 8 " .. 1 10
16 " ⅝ " " 8 " .. 1 20
5c ₱ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each.....18c
" " wide track, each.....20c
Single Tree Irons, ₱ set of four pieces.....38c
Wrought Iron Bolster Plates, 2¾ in. wide, ₱ set.....60c
" " 3 " " 65c
" " 3¼ " " 70c
" " 3½ " " 75c
Wagon Brake Ratchets, each.....16½c
" " finished with guard, each..45 c
Wrought Hammer Straps, heavy pattern, each.....16 c
" " light " each.....13½c
" Rub Irons, each.....11 c
Stay Chain Hooks, each.....8 c
Double and Single Tree Clips, figure 1, each.....9 c
" " " 2, each.....10 c
" " " 3, each.....12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 100 sets.....dis 25 %
Wagon Box Staples, 1¾ to 2¼ in. to clinch, ₱ 1000 $12 00 net
" " Box Iron, to rivet on, ₱ 1000 8 00 net
Neck Yoke Eyes, each.....5c net
" " with ⅝ rings, each.....7¼c net
King Bolts, ¾, 1, 1¼, and 1¼ in. diam.....₱ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam, all lengths..... " 9 c net
Wagon Rivets, 3-16 in. diam., all lengths..... " 11 c net
" & Nails, in 5 ℔ paper boxes....₱ ℔ 1c extra
" " in 25 ℔ wood " ½c extra
Wagon and Hinge Nails, ¼ in.....₱ ℔ 17 c net
" " 3-16 in..... " 19 c net
Double Tree Plates.....
Coupling " ..... } " 9 c net
Tongue " .....
Neck Yoke Plates..... " 12 c net
Tongue Cap Iron, 1¼, 2 & 2¼ in. wide, same price ₱ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in, ₱ ℔ 11 c net ⅛ in., 12 c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal

IC, 10x14	$13 00
IX, 10x14	15 75
XX, 10x14	18 50
IC, 12x12	13 50
IX, 12x12	16 25
IC, 14x20	14 00
IX, 14x20	16 75
XX, 14x20	19 50
XXX, 14x20	22 25
XXXX, 14x20	25 00
DC, 100 Plate	12 50
DX, "	15 25
DXX, "	18 00
DXXX "	20 75
DXXXX 100 Plate	23 50
IX, 14x14	25 00
IC, 10x14 W	12 50
IX, 10x14 W	15 25

Roofing Tin.—Best Char.

IC, Terne, 14x20	$12 25
IX, " 14x20	15 00
IC, Terne, 20x28	26 00
IX, " 20x28	30 50

Coke Tin.—

IC, 10x14 Coke	$11 00
IX, 10x14, Coke	13 75
IC, 14x20, "	12 00

Sheet Zinc.—Any width.....10 c
Copper.—
Sheathing.....33c
Copper Bottoms.....36c
Planished Copper.—
Sheathing, 14x48.....41 c
Boiler Size, No. 7.....43c
" " No. 8.....43c
" " No. 9.....43c
Pig Tin.—Large Pigs..35c
Small Pigs.....36c
Bars.....37c
Solder.—No. 1.....18c
No. 2.....20c
Bright Wire......dis 35 %
Sheet Iron.—
No. 18 Am. Com.....5 50
No. 24 Am. Com.....5 50
Pat. Am. Russia "A,"
Nos. 24, 25 & 26..... c
Pat. Planished Russia... c
Russia No. 9, 10, 11 & 12... c
W. D. WOOD'S & CO.'S SHEET IRON.—

Nos. 15 to 20 Smooth	$6 10
" 21 to 24	6 30
" 25 & 26	6 50
" 21 to 24 Char'l	7 80
" 25 & 26 "	8 00

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A. PARDEE & CO.,

303 Walnut St.,

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A. Pardee & Co. { HAZLETON, CRANBERRY, SUGAR LOAF
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WM. LILLY Mauch Chunk, Pa.
WM. MERSHON, Agent, 111 Broadway N.Y
WM. H. DAVIS, Agent, Easton Pa.

Steel.

THREE 1st CLASS PRIZE MEDALS. CLASSES 1, 21, 22, Great Exhibition of Industry, LONDON, 1851.

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS I. UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

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BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES; Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

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CHICAGO, Crerar, Adams & Co.....NEW ORLEANS, Folger & Co.

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MOSS & GAMBLE **SUPERIOR C. S.** "FULL WEIGHT" **FILES,**

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.

Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.

Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.

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MANUFACTURERS OF

Steel Rails, Tyres, Wheels,

Axles, Shafting, Boiler & Ship Plates, Bessemer Pig Iron, etc., etc.

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STEEL

For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

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DOG BRAND FILES,

Unsurpassed, if equaled in quality.

Bailey Lane Works, Sheffield, England.

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PHILADELPHIA, Wm. H. Sowers. | MONTREAL, Saint Paul St.

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Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

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Cast and Double Shear STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

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In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed.

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STEEL.

Bailey Street and Broad Lane Steel Works, } SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills, &c.**

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D. G. GAUTIER & CO.,

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Hammered and Rolled STEEL of every description

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WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—FOR EVERY PURPOSE.

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Sheffield Steel Works.

(Established in 1848.)

SINGER, NIMICK & CO.

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Manufacturers of **Extra Quality Tool**

CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel,

Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, ow Bars, &c., &c.

Warehouse, 63 Water and 100 First Streets.

ISAAC JENKS & SONS,

Minerva & Beaver Iron & Steel Works

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MANUFACTURERS OF

"Jenks" Spring Steel, Cast and Swedes Spring Steel,

TIRE, TOE CORK, SLEIGH SHOE, BLISTER & PLOW STEEL.

Also, Plow and other Iron.

VAN WART & McCOY, Agents,

43 Chambers St., New York.

A full assortment of "Jenks" Spring Steel in stock.

MILLER, BARR & PARKIN,

Crescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all descriptions of

STEEL.

EQUAL TO ANY IN THE MARKET.

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ESTABLISHED IN 1801,

Have maintained their great reputation for years. Manufacture the

Celebrated Eagle Ducking, Eagle Rifle and Diamond Grain Powder.

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LAFLIN & RAND POWDER CO.,

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invite the attention of the the Hardware Trade to their facilities for delivering

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IN EVERY PART OF THE UNITED STATES, from having agencies and magazines at all prominent points, beside our works at

Newburg, Saugerties, Kingston, and Catskill, N. Y.; Scranton, Carbondale and Pottsville, Pa.; Baltimore, Md., and Platteville, Wis.

The superiority is well known of our brands Rifle Powder

Orange Rifle, *Orange Ducking,*

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SAFETY-FUSE at wholesale.

CHICAGO.

(Reported by Markley, Alling & Co.)

Agricultural Implements.—
Scythes—Dunn Edge Tool Co.....dis 30 %
Hay and Manure Forks—Otsego extra C. S.....dis 30 %
Hoes and Garden Rakes—Jackson and Otsego...dis 30 %
Scythe Stones.....dis 25 %
Scythe and Bush Snathes.....dis 25 %
Harvest Rakes and Barley Forks.....dis 25 %
Revolving Horse Rakes.....dis 25 %
Handles—Fork and Shovel.....dis 25 %
Cradles—Nithington, Cooley & Co.....dis 25 %
—Genuine Morgan.....₩ doz net $34 00

Augers and Bits.—
Ives' extra C. S....dis 30 % | Snell's.....dis 10 %
Jennings'.....dis 5 % | " Car Bits.....dis 10 %
Cook's.....dis 30 %

Axes.—Amoskeag Yankee.....₩ doz $13 50
Amoskeag Crescent..... " 14 00
Hunt's Bronzed..... " 13 00
Kennebeck Yankee..... " 12 00
Lipplucott " ..... " 13 00
" Crown..... " 14 00
" Beveled..... " 14 50
Jefford's Silver Steel..... " 13 00
Red Warrior, Beveled..... " 14 00
Kennebeck, Handled..... " 15 00
Boy's, Handled..... " 12 00

Bolts.—Carriage and Tire.....dis 20&20 %
Cast Barrel and Shutter.....dis 20&10 %
Wrought Iron Barrel.....add 10 %
" " Square.....net list

Butts.—Cast Fast Joint, Narrow.....dis 30 %
Cast Fast Joint, Broad.....dis 30 %
" Loose Joint.....dis 50&5 %
" " Pin, Reversible.....dis 40 %
" " Japanned.....dis 35 %
" " Silver Tipped.....dis 35 %
Wrought Narrow, Fast Joint.....dis 30 %
" Broad " " .....dis 30 %
" " Loose " .....dis 30 %
" Loose Pin.....dis 30 %
" Table.....dis 30 %
" Brass.....dis 10 %
Garretson's Blind Butts, Wood.....doz sets $1 75
" " Brick.....doz sets 4 75
Parker's " Wood.....doz sets 1 85
" " Brick.....doz sets 2 75

Casters.—Iron Plate.....dis 25 %
Brass Wheel Plate.....dis 25 %
Porcelain Wheel Plate.....dis 25 %
" Bed.....dis 25 %
Iron Wheel Bed.....dis 25 %

Chisels.—Butcher's Tanged Firmer.....dis 30 %
" " Long Paring.....dis 30 %
Witherby Socket Framing.....dis 50&20 %
" " Firmer.....dis 50&20 %
" " Corner.....dis 50&20 %
" " Slicks.....dis 50&20 %

Coffee Mills.
Box 4 Iron.....$ 3 75 | Box 85 Cast Steel.....$12 00
" 103 " ..... 5 25 | Side 50..... 4 75
" 102 " ..... 6 25 | " 60..... 5 75
" 107 Britannia... 7 50 | " 70..... 7 25
" 106 " ..... 8 50 | " 90..... 18 00
" 25 Union..... 10 50 | " 15 Union..... 7 00
" 35 " ..... 12 00 | " 20 " 8 00
" 75 Cast Steel.. 19 50

Cutlery.—American Table.....dis 20 %
" Pocket.....dis 25 %

Door Springs.—Torry.....₩ doz $5 00
Rubber..... " 4 00
Boon's..... " 5 00

Drawing Knives.—Witherby Tool Co....dis 50&20 %
Ohio Tool Co.....net list

Files.—Butcher's.....$7 00 £
Nicholson's.....$5 00 @ $5 50 £

Hammers.—
Maydole's.....net list | Yerks & Plumb.....net list
| Cheney.....net list

Handles.
Extra Axe...₩ doz. $3 00 | Coal Pick, No. 1..₩ doz $2 00
No. 1 Axe.... " 2 25 | Sledge, No. 1..... " 2 00
No. 2 Axe.... " 2 00 | Hatchet..... " 65
R.R. Pick, No. 1 " 2 00 | Hammer, A. E.. " 65

Hatchets.— 1 2 3
Amoskeag Shingling.....$7 25 $8 00 $8 75
" Claw..... 7 75 8 50 9 22
" Lath..... 7 50 8 25
" Solid Steel..... 12 00

Hinges.—Strap and T.....dis 30 & 7½ %
Screw Hook and Strap, 8 to 12 in.....net, 9c. ₩ lb
" " 14 to 24 in.....net, 7½c. ₩ lb
Hook and Eye Hinges.....net 12c. @ 16c. ₩ lb
Gate, No. 35, State.....₩ doz $3 50
" No. 3, In and Out..... " 3 50
" Blind's Pat..... " 7 50

Horse Nails.—Northwestern, 8d.....24c
Ausable, 8d.....24c
Globe, 8d.....26c

Kettles.—Brass .....54c | Enameled..... dis 30 %

Locks and Knobs.—
Norwalk Lock Co. dis 45 % | EagleLock Co.....dis 15 %
Branford " . dis 45 % | Am. Pad Locks.....dis 35 %
| Cont'l'al Lock Co. ..dis 10 %
| Woodruin Patent ...net list
| Stowe's Sausage Stuffers.....net list
| Enterprise Patent...dis 5 %

Meat Cutters.—
Haven's Patent ...net list
Hale's " ...dis 10 %

Molasses Gates.—
Stebbin's Patent ..dis 50 %

Nails.—10d to 60d.....per keg $4 12½ @ 4 27

Oil Stones.—Washita No. 1.....net 30c ₩ lb
Washita Slips.....net 60c "
Hindostan No. 1.....net 9c "
" Axe.....net 10c "
" Slips.....net 15c "

Picks and Mattocks.—Picks, Railroad,
Axe Finish.....₩ doz $12 00
Picks, Coal, Axe Finish..... " 10 00
Mattocks, L. C., Axe Finish..... " 15 00
" S. C., " ..... " 14 50
Grub Hoes, Axe Finish, No. 2..... " 1 00

Planes.—Ohio Tool Co., Bench.....dis 25 %
Sciota.....dis 30 %
A. Howland & Co., Bench.....dis 25 %
" Fancy.....dis 25 %
Bailey Patent Iron.....dis 15 %
Plane Irons, Butcher's.....dis 30 %

Rivets.—Iron .dis 10 @ 15 % | Copper, No. 7. net, ₩ lb, 20c
Tinned.....dis 10 @ 15 %

Rules.—Stanley Rule and Level Co.....dis 50&10 %
Hubbard & Curtiss Mfg. Co.....dis 50&10 %

Sad Irons.—Best A No. 1..... ₩ lb, 4½c
" Copper Face Star.....₩ lb, 4½c

Sandpaper.
Baeder & Adamson's No. 0 to 1½.....per ream, net $4 50
" No. 2 to 3..... " net 5 00
Wiggin & Stevens, No. 0 to 1½.....₩ ream, net, $4 50
" " No. 2 to 3..... " " 5 00

Sash Locks.—Champion.....₩ gross, net, $12 00
Hopkins & Dickinson.....dis 10 %
Judd's Patent.....dis 10 %
Corbin's Patent.....dis 10 %
Clark's Patent.....dis 20 %

Saws.—H. Disston & Sons.....dis 10 %
Champion X Cut.....₩ foot, net, 60c
M. A. & Co. X Cut..... " " 50c
Lightning Cut..... " " 66c

Screws.—American Screw Co.—Iron...new list dis 50 %
American Screw Co.—Brass.....dis 50 %

Shovels and Spades.
Ames' Black Shovels.....₩ doz $14 50
" Polished " ..... " 15 50
" Patent " ..... " 18 00
Alling " " ..... " 16 00
" " " Molders'..... " 18 00
Crane's Black " ..... " 11 50
" Polished " ..... " 12 00
Smith's " " B. S. L. H. Rd. Pt.... " 13 50
" " " B. S. D. H. Rd. Pt.... " 14 00
Ames' Black Spades..... " 16 00
" Polished " ..... " 17 00
" Patent " ..... " 17 50
Alling " " ..... " 16 00
Crane's Black " ..... " 12 50
" Polish'd " ..... " 13 50

Scoops.—Alling Steel Polished, No. 2.....₩ doz, $13 50
Alling Steeled Polished, No. 3..... " 14 00
" " No. 4..... " 14 50
" " No. 5..... " 15 50
" " No. 6..... " 16 50
" " No. 7..... " 17 50
" " No. 8..... " 18 50
" " No. 10..... " 21 50
Crane's Polished, No. 5..... " 13 50
" No. 6..... " 14 50
" No. 7..... " 15 50
" No. 8..... " 16 50
Crane's Black Coal, No. 4..... " 17 50
" " No. 5..... " 18 00
Preston, Black Scoops No. 1..... " 12 00
" " No. 2..... " 12 50
" " No. 3..... " 13 00
" Half Pol. Scoops No. 1..... " 12 50
" " No. 2..... " 13 50
" " No. 3..... " 14 50
Lippincott, Half Pol. No. 2..... " 15 00
" No. 3..... " 16 00

Wrenches.—Taft's.....dis 60 %
Coe's Imitation.....dis 50 %
Coe's Genuine.....dis 30 %

Wringers.—Novelty Clothes Wringer.....₩ doz $69 00
Universal Clothes Wringer..... " 72 00

Chicago Metal Market.

(Reported by Cragin Bros. & Chandler, 141, 143, and 145 Lake St.)

Tin Plate.—
IC, 20x14, Coke.....$11 50
IC, 10x14, Charcoal. 12 50
IX, 10x14 " . 15 50
IC, 12x12, " . 13 00
IX, 12x12, " . 16 00
IC, 14x20, " . 13 50
IX 14x20, " . 16 50
IXX, 14x20, " . 19 50
IC, 14x28, Coke Roofing..... 19 50
IC, 10x20 Coke, for Gutters..... 12 00
IC, 14x20, Charcoal Roofing..... 12 00
IX, 14x20 " 15 00
IC, 20x28, " 25 00
IX, 20x28, " 50 00

Pig Tin.—
Large, 60 lb.....33c | Small, 30 lb.....34c
| Bar Tin.....35c

Zinc.—
In casks 1000 lbs.....c | In sheets.....11 c
" 500 " .....10½c | Slab.....9c

Copper.—Copper Bottoms.....41c
Sheathing Copper.....34c
Planished Copper.....41c
" " cut to lengths.....43c

IXXX, 14x20, " ... 22 50
IXXXX, 14x20, " ... 25 50
IX, 14x14, " ... 27 00
DC, 100 Plate, " ... 12 50
DX, " ... 15 50
DXX " ... 18 50
DXXX, " ... 21 50

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 42 to 48 Batterymarch St.)

Anvils.—Eagle, ₩ lb 11c. currency.....dis 15 @ 15&5 %

Augers.—Watrous Ship.....dis 10 %

Axes.—Forester's Favorite, Bronzed.....$12 50
Blue Jackets, Blue..... 12 00
Chopper's Prize, Bronzed..... 11 00
Red Cross, Red..... 10 50
Red Cross, Handled..... 13 50
Boy's Handled Blue Jackets..... 12 00
Hunts Axes.....₩ doz $15 @ 17 50 net @ 5 %
" Hatchets.....net
Shingling Nos. 1, 2, 3.....₩ doz $7 25 8 00 8 75
Claw " 1, 2, 3..... " 7 75 8 50 9 25
Lathing " 1, 2, 3..... " 7 50 8 25 9 00

Axe Handles.—Hickory, Fisher Pat..No. 1 ₩ doz $2 75
Hickory, Fisher Pattern..... " 2 " 2 00
Oak, " " ..... " 1 " 2 75
" " " ..... " 2 " 2 00
" " " ..... " 3 " 1 50

Blind Hinges.—Washburn's....per hundred set $10 00

Blind Fasts.—Washburn's.....per hundred set $6 00

Bells.—"Connell's" Thumb Latch.....dis 50&10 %

Bolts.—Carriage. Phila., "Giraru Works,....dis 50&5 %

Borax.—Best, cases and bbls.....₩ lb 18c

Borers.—Angle. Backus'.....dis 30 %

Boring Machines.—Angle.....each $4 75
Common. Snell's quality.....each 3 75

Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 40 %

Butts.—Union Drilled Loose Joint.....dis 60 %
" " Wire Fast Joint.....dis 50 %
" " Acorn Loose Joint...dis 50&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
Wrought Narrow Butts.....dis 30 %

Cartridges.—" U. S. Cartridge Co."....dis 50 %

Chisels.—"Buck Bros.' Shank Goods....add 20 @ 22½ %
Sockets.....add 22½ @ 25 %

Compasses and Dividers.—Bemis'.....dis 35 %
P. S. & W.....dis 25 %

Cordage.—Manila (usual trade dis.).....₩ lb, 17c
American Tarred hemp Lath Yarn.....₩ lb, 10c

Crow Bars.—Iron, Steel Points.....₩ lb, 3½c
"Sweet" Steel Bars.....₩ lb 11c
Brown's Steel Bars.....₩ lb 10c
K. P. & Co. Solid C. S.....₩ lb 15c

Dividers.—Crook's Nickel Plated.....dis 15 %

Door Springs.—Stimson's Patent.—
No. 7, Light inside doors, $12·00.....dis 25 %
No. 8, " outside " $18·00.....dis 25 %
Torrey's.....$4·00

Drawing Knives.—Kimball Solid Steel.....7½c inch
Emery.—Wellington Mills.....₩ lb 10c
Alden's.....₩ lb 4c

Files.—Earl Smith & Co.'s English.....$5 to £ gold
American.....$5 to £ currency, less 10 %
Nicholson.....$5 to £ currency, less 10 %
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·62; 4, $1·88; 4½, $2 13; 5, $2·50.

Funnel Irons.—$2·50 $2·50 $2·50 $3·25 per doz
5, 5½, 6, 7 inch
Deep Flange, $3·50 $3·75 $4·00 per doz
5, 5½, 6 inch

Hammers.—Maydole.....dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9·75
" " " " " bell face, No. 1, $11; 1½, $9·75.

Hangers & Rollers.—Novelty.....dis 30 %
Rider, Wooster & Co.....dis 30 %

Hatchets.—Underhill Edge Tool Co.....dis 10 %
Underhill pattern, solid, C. S. lathing.....$9 50
Underhill Bros. pattern, solid C. S. Lathing.....10 00
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4·75; 1, $5·25; 2, $5·75
Claw.....1, 5·75; 2, 6·25
Lathing.....1, 5·50
Axe Pattern.....1, $7·00; 2, 7·50
Broad.....0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75.

Hinges.—Strap and T, Stanley Works.....dis 25&7½ %
Plate, Loose and Fast Joint.....₩ lb 75c
Wrought Screw Hook.....₩ lb 8c

Hoes.—Ely Balch & Co. M., B. & D.'s list, 1874...dis 25 %
Remington, M., B. & D.'s list, 1874.....dis 30 %

Lead.—Sheet and Pipe.....9c—dis 10 %

Locks.—P. & F. Corbin.....new list dis 45&5 %

Manure Forks.—
Myers & Ervien, M., B. & D.'s list, 1874.....dis 25 %
Peck, Clark & Co., " " .....dis 25 %
Shumway & Co., " " .....dis 30 %
Partridge (Original) " " .....net
4 square Tine, $12·00; 6 square Tine, $24·00.
4 oval Tine, $12·00; 5 oval Tine, $18·00; 6 oval Tine $24·00.

Mattocks.—K. P. & Co.. axe finish, long cutter..$13 75
Short cutter.....13 50

Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₩ lb

Nails.—10d and larger.....$4 25

Padlocks.—Wilcox.....dis 50&2 %
All Brass, 2¾ inch, 2 keys, job lot.....$9 00

Picks.—K. P. & Co., Polished Points—
5 to 6.....per doz ₩ 00 ; 6 to 7, $9 50

Potato Digger.—
"Partridge," 6 square tine.....₩ doz $12 00
Shumway & Co., 6 round tine..... ₩ doz 9 00

Pulleys.—Clark & Co.'s Axle, 2 in.....per doz 42c

Plated Ware.—Rogers Bros.....new list dis 30 %

Plumb & Levels.—"Davis" Pat. Adjust..dis 60&10 %
"Davis" Pat. Adjustable Inclinometer, wood and iron.....dis 33⅓ %

Pocket Knives.—Conn. Cutlery Co.....new net list

Rakes.—Cast Steel, garden.....dis 30 %
Malleable.....dis 25 %

Rivets.—Black.....dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8.
13 13 14 14 15 16c ₩ lb net

Sad Irons.—Bless & Drake.....₩ lb 4½

Sand Paper—0 to 2, $4·25; 2 to 3, $4·75..new list dis 10 %

Saws.—Disston's.....dis 12½ %
Lightning X cut, Boynton's.....per foot 6½c
" Saw Blades, 32 inch.....per doz $7 00
" Framed Saws.....per doz 8 50
Common " " .....per doz 6 00
Disston " " .....per doz 9 00
One man X cut.—Lightning.....$3 75 each
Disston's $3·00 each.....dis 12½ %

Saw Clamps.—Reading.....$11·25

Screws.—American Screw Co.....revised list dis 62½ %

Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $6·50
" " second quality..... " 3·00

Shovels.—O. Ames.....new list dis 12½ %
M. B. & D.....new list dis 12½ %

Sifters, Coal.—McMasters.....$12·00

Spading Forks.—M. & E.....dis 25 %

Stone Pickers.—"Partridge," original...₩ doz $15 00

Tools.—Aiken's Pattern, 20 in set; Miller's Falls, $12·00 per doz.....dis 15 %

Traps.—Oneida.....dis 30 %
Blake's.....dis 20&5 %

Trowels.—Bisbee Patent Ferrule.....net list

Vises.—K. P. & Co.'s Solid Box, Blacksmith...₩ lb 14½c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 15 %

Wardrobe Hooks.—Wire to drive.....₩ gross $1 00

Weights.—Window Weights.....₩ lb 2½c

Wire Netting.—Clinton Wire Cloth Co.....₩ ft 6½c

Wrenches.—Coe's Genuine Wrenches.....dis 40&5 %
Coes' Pattern.....dis 60 %

Wringers.—
Novelty and Universal } Tub No. 2 { 1 doz lots.....per doz 69 00
{ 2 doz lots.....per doz 67 00
Novelty Bench, No. 4, 1 doz lots.....per doz 101 00

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz.)

Tin Plates.—₩ box
I. C. Char. 10x14 @ $12 50
I. C. Coke 10x14.. 11 00

Pig Tin.— ₩ lb
Banca.....36c

Copper.— ₩ lb
Sheathing.....32c

Lead.— ₩ lb
Pig.....7½c
Char Roof. I C, 10x14 $12 00
Coke " I C, 10x14 11 00
Straits.....31c
English.....30c
Bolt.....35c
Ingot.....36c
Sheet and Pipe.....9c

Spelter......₩ lb 9½c

Zinc.—Sheet.....₩ lb 10½c

Antimony......16c

Iron.—Sheet Iron, Russia..... " 19c
Sheet Iron, English..... " 5½c
" " American Refined..... " 6½c
" " Galvanized..... " 11½c
Plate Iron.....
Swedish and Norway Bar Iron, gold.....₩ ton, $135 00
" " Shapes, gold..... 142 50
Norway Nail Rods, first quality, gold..... 162 50
" " second " " 147 50
Best Refined Bar Iron..... 75 00
The "Burden Best" Iron..... 112 00
American Pig Iron, Foundry, No. 1, x..... 38 00
" " No. 2, x..... 36 00
" " Gray Forge..... 32 00
Scotch Pig Iron.....₩ ton 44 00 @ 48 00
Wrought Scrap Iron..... 42 50

Steel.— ₩ lb
Eng. Tool..... 18c
American Tool 15½c
" Mach 11c
Forgemer..... 10c

German ..... 11 c
Spring..... 4 c
Tire..... 7 c
Sleigh Shoe..... 5½c
Tire Calk..... 5½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Anvils.—Armitage.....₩ lb., gold, 13c
Peter Wright's..... " 4c
Wilkinson's..... " 2¾c

Apple Parers.—Conqueror.....₩ doz, $9
Lightning..... " 9 00
Turn Table..... " 9 00

Axes.—Hunt's.....₩ doz $13 00 @ 13 50
Lippincott's..... " 12 00 @ 12 00
Lippincott's Pioneer..... " 13 00 @ 13 50
Simmons'..... " 12 00 @ 15 00

Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles.....new list net
Swelled Taper Axles.....new list net
Concord Axles.....new list net
Red Jacket Axles.....new list net
Common Axles, 1½ inch and upward.....₩ lb., 8½c
" " less than 1½ inch..... " 9½c

Bellows.—"Best St. Louis make" 60c ₩ in. dis 30 %

Bells.—Troy, Church.....₩ lb., 5c
Light Brass, Hand.....dis 50 %
Moore's, Cow.....dis 20 %

Bolts.—Arms, Bell & Co.'s Machine.....dis 20 %
Arms, Bell & Co.'s Carriage and Tire.....dis 75 %

Cast Butt Hinges.—Western Butt Co.'s—
Narrow Fast Joint.....dis 25 %
Broad Fast Joint.....dis 50 %
" Loose " .....dis 60
Reversible.....dis 45 %
" Japanned and Silver Tipped.....dis 45 %
Loose Joint "Acorn" " " .....dis 75 %
Excelsior Reversible Blind.....dis 30& 10 %
Lull & Porter's Blind.....dis 45 %

Wrought Butts.—Narrow.....dis 20 %
Reversible.....dis 25 %
Broad.....dis 25 %
Table Hinges.....net list
Back Flaps.....net list
Inside Blind Hinges.....net list

Chain.—Eng. Coil..3-16 ¼ 5-16 ⅜ 7-16 ½ in.
13 11 10 9½ 9 8c gold
Trace.....6½-10-2 7c " " 10-2 8c "
German Coil and Halter.....revised list add 10 %

Chisels.—Socket, Firmer or Framing.....dis 35 %

Clothes Wringers.—Crown.....₩ doz $40 00
Novelty..... " 72 00
Universal..... " 72 00
Monitor..... " 72 00

Corn Knives.—Dunn Edge Tool Co.'s Clip..₩ doz $5 75
Disston's..... " 6 00

Crow Bars.—Steel Pointed.....₩ lb 7 @ 9c
Solid Cast Steel..... 40c

Cutlery.—J. Russell & Co.'s.....
Lamson, Goodnow & Co.'s..... } new list, dis 15 %
Landers, Frary & Clark's..... }

Files and Rasps.—
Nicholson's Files.....$5 00 less 5 %
Butcher's Mill..... ₤ 75 to the £. currency
Heller's & Bros' Horse Rasps.....dis 40 %

Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks.....dis 30 %
" " Handled Hoes.....dis 30 %
" " Planter Eye Hoes.....add 5
Winsted's Planter Eye Hoes.....add 5

Hammers.—Yerkes & Plumb.....dis 5 %
Masons' Hammers.....₩ lb 30c
Smith Hand Hammers..... " 22c

Handles.—Axe.....Extra. No. 1. No. 2. No. 3.
$2·75 $2·25 $1·75 $1·00
Pick.....Extra. No. 1. No. 1½. No. 2.
$2·50 $2·00 $1·75 $1·25
Smith & Montross Fork, Hoe and Rake.....dis 20 %
" " Broom and Mop.....$12 @ $18 ₩ M

Harrow Teeth.—1 inch iron.....₩ lb 4½c
⅞ and ¾ inch Iron..... " 4½c
⅝ inch iron..... " 5 c
Barbed or Headed.....½c extra

Hatchets.—Hunt's.....dis 10 %
Simmons'.....dis 15 %

Hay Knives.—Lightning.....₩ doz $22 00
Dunn Edge Tool Co.'s.....₩ doz $14 50—dis 15 %
Fisher's..... " 16 50—dis 10 %

Hinges.—Strap and T—St. Louis make.....dis 25 %

Horse Nails.—Eureka.....22c rate
Ausable.....22c "
Northwestern.....22c "
Eagle.....19c "
National Patent Pointed.....21c "
" " Extra Finished.....22c "

Horse Shoes.—R. I. (Perkin's pat.).....₩ keg $6 50
Burden's..... " 6 50
Mule Shoes..... " 7 50
Rhode Island Trotting Shoes..... " 9 00

Locks and Latches.—
Jones & Nimick's.....revised list dis 40 %
Moorhead, Adams & Co.....revised list dis 40 %
Norwalk Lock Co.'s.....revised list dis 40 %

Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks...₩ doz. $15 00 @ 16 00
Grub Hoes, Oval Eye.....₩ doz. 12 00 @ 13 00

Nails.—Wheeling.....$4 10 rates
Orders for 100 kegs 10c ₩ keg less.

Picks.—Klein, Logan & Co.'s R. R. and Clay ₩ doz.$12 00
Klein, Logan & Co.'s Coal..... " 9 75
" " Poll..... " 12 00
" " Stone..... " 16 50
" " Tamping..... " 19 00

Planes.—Ohio Tool Co.'s.....dis 25 %
Sciota.....dis 30 %

Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $21; No. 2, $30; No. 3, $32.....dis 30 %
Barton's Patent.....₩ doz $25—dis 50 %
Vaughn's " .....25—dis 10 %

Sad Irons.—Monitor Brand, Silver Polished..₩ lb 4½c

Sash Weights.—Standard Solid Eyes.....₩ lb 3½c

Saws.—Disston's.....dis 10 %
Hubbard, Lippincott, B. & Co.'s.....dis 10 %
Branch, Crooks & Co.'s.....dis 15 %
Livingston's Patent Buck.....net list

Screws.—American Screw Co.'s revised list....dis 50 %

Scythes.—
Dunn Edge Tool Co.'s.....new list dis 25 %
Paris Furnace Co.'s.....dis 50 %

Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00
Extra Indian Pond..... " 7 50
Premium..... " 9 50 dis 25 %
Diamond Grit..... " 13 50

Shovels, Spades and Scoops.—
Ames'.....dis 7½ %
Lippincott's.....new list dis 15 %
Rowland's, Maxwell.....revised list dis 12½ %

Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ lb., 17c
Solid Cast Steel..... " 35c
Striking Sledges.....₩ lb extra, 1c

Spaths and Cradles.....dis 25 %

Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 20 %
Blue Seat Springs.....new list dis 15 %

Tacks.—Norway Tack Co.'s ½ weight.....dis 70 %
Brads ½ weight.....dis 50 %

Thimble Skeins.—Pump & Skein Co.'s...dis 50&10 %

Traps.—Newhouse Patent.....dis 15 %

Vises.—Solid Box.....₩ lb 16c
Wilson Mfg. Co.'s.....dis 15 %

Wrenches.—Coes' Genuine.....dis 33⅓ %
Coes' Pattern.....dis 10 %
Taft's.....dis 60 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.

Tin Plate.
IC, 10x14, Charcoal...$12 50
IX, 10x14, " ... 15 50
IC, 12x12, " ... 13 00
IX, 12x12, " ... 16 00
IC, 14x20, " ... 13 50
IX, 14x20, " ... 16 50
IC, 14x20, Terne..... 12 00
IX, 14x20, " 14 50
IC, 20x28, " 25 00
IX 20x28. Terne..... 30 00

IC, continuous, 20 in. x 200 ft.....
IX, continuous, 20 in. x 200 ft.....
IC, 10x14, best Coke...$11 50
IC, 10x14, good " ... 11 00
IC, 10x20..... 19 00
IC, 14x20..... 11 50
IC, 14x28, Coke Lead. ₩ lb
IC, 10x14, punch'd for Safes..... 16 00

Block Tin.
Large Pigs.....30c | Bars.....32c
Small " .....31c |

Sheet Zinc.
Casks.....₩ lb 10½ c | Sheet.....₩ lb 11c

Solder.
No. 1, Refined, in bars or plate.....20c
No. 2, " " 18c
Pig Lead.....7½c

Sheet Copper.—18 to 100 lbs. Sheets 30x60.....36c
14 to 16 lbs., Sheets 30x60..... 35c
10 to 12 lbs., " and 30x72..... 38c
6 to 9 lbs.. " 41c
Tinned, 14 and 16 oz. 14x48..... 24c
Planished, 14 and 16 oz. 14x48..... 41c
" No. 7, 8 and 9..... 43c
Copper Bottoms..... 35c

Sheet Iron.—

	Com'n	Sm'th.	Char'l.	Japan'd.
No. 16 to 20.....	5c	6c	8c	10c
No. 22 to 24.....	5c	6c	8c	10c
No. 26.....	5½c	6½c	8½c	10½c
No. 27.....	6½c	6½c	8½c	10½c

Galvanized Iron.....dis 15 %
Iron Rivets.....dis 20 %
Iron Wire.....dis 20 %
Coppered Market Wire.....dis 25 %
Copper Rivets and Burs.....dis 10 %
Russia Iron.—Nos. 9, 10, 11 and 12, ₩ lb.....22c
No. 1, stained, ₩ lb.....20c
Imitation Russia, ₩ lb.....18c

Woodruff Iron Works,

HARTFORD, CONN.,

Office, - - - - - - No. 223 State Street.

Manufacturers of the Celebrated

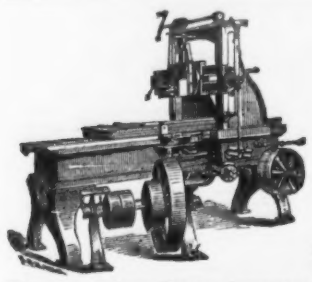
WOODRUFF & BEACH STEAM ENGINE,

With Recent Improvements.

STEAM BOILERS

Constantly on hand, and made to order—of any size or style. Special attention given to all kinds of

MILL MACHINERY & CASTINGS.



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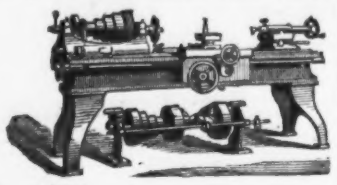
Of excellent designs and workmanship, complete, with best modern attachments. Gun and Sewing Machine Machinery and Fixtures in great variety, Friction Clutch Pulleys



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MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order.

The "EMPIRE," a Fan Blowing

PORTABLE FORGE,

(Patent Applied for.)

Without BELTS or BELLOWS.

It is more **Easily Worked, gives a Better Blast,** and is the **Cheapest** forge made, and

☞ It has no Back Draught.

W. P. KELLOGG & Co., Troy, N. Y.

And 84 Chambers St., N. Y.

Also **Curry Combs, Boring Machines,** and **Cooley's Whip Racks, etc., etc.**

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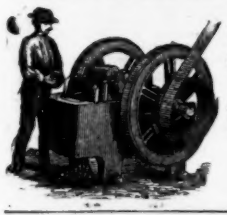
STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds o hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

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Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

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Manufacturer of **ENGINE LATHES,** from twelve (12) to forty-eight (48) inches swing; **Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press** for Mandrels; **Grindstone Boxes.**

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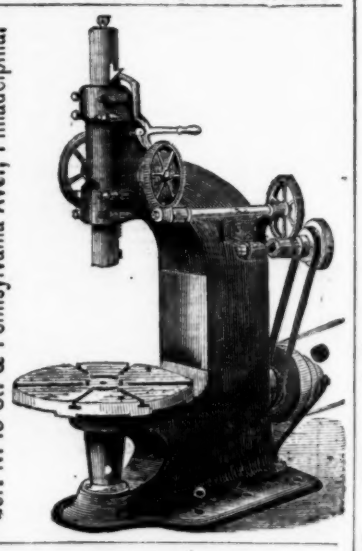

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Gauge Lathes, Screw Machines,

Stave Saws, Woodworth Planers,

Tub, Pail and Chair Machinery, a specialty, by

GOODSPEED & WYMAN, Winchendon, Mass.

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STEAM PUMP WORKS,

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Of all descriptions and for all purposes, of any proportion or size, for pumping Hot, Cold, Fresh, Salt, Mudd or Gritty Water, Grain-mash, Syrups all kinds of Beer, Acids, Molasses, and all heavy and thick fluids. Also for Feeding Steam Boilers, Supplying Tanks, and for Sugar Refineries, Tanneries, Oil Refineries, Gas Works, Hotels, Breweries, and for all classes of manufactories; for Draining Mines and Excavations, and for Rolling Mills, Blast Furnaces and Water Works supplying Cities, Towns and Villiages with Water; also, for Wrecking purposes and Steam Fire Engines for Land and Sea.

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Only cause of selling, owner has a larger and more important enterprise on hand, which will require his whole attention and the above amount of extra cash. **"The Danbury"** is now *everywhere* acknowledged to be the best Chuck for all purposes ever put on the market, has had a large and rapid sale, being a decided "take" from the first. $20,000 would not buy it, except for reasons named. Can show clearly where over $10,000 per year can be made out of it, the principle being perfectly adapted to every thing, from a dental or jewellers' drill to a car wheel Chuck. Unless sold before June 1st, it will not be for sale. For illustrated descriptive list and further information, address the

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DIRECT ACTION STEAM PUMP,

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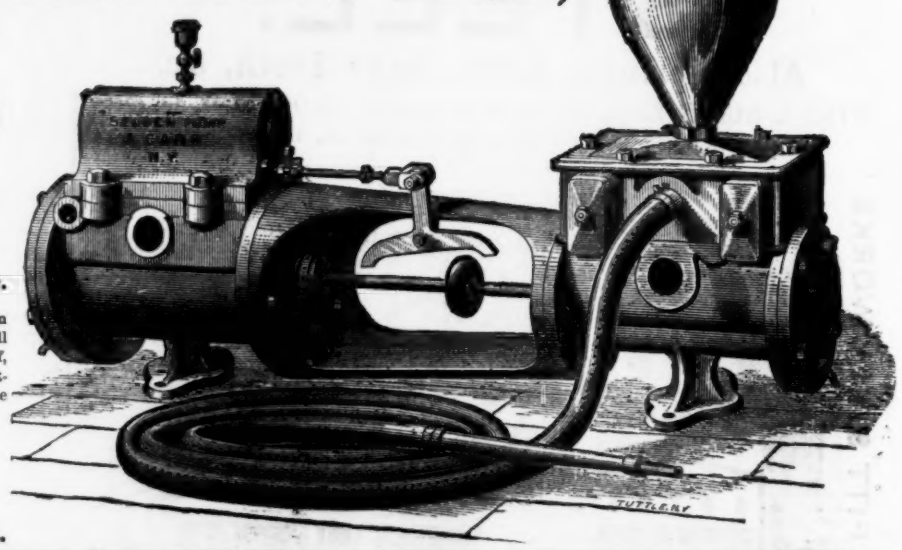
Tank Pump, with Boiler Feed Attachment.

For Boiler Feeders,
For Water Works,
For Fire Pumps,
For Mines, etc., etc.



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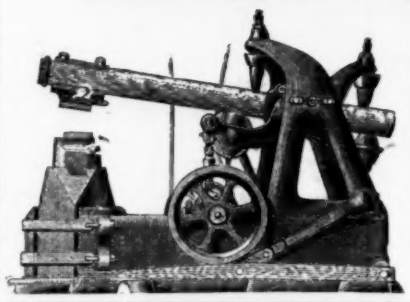

This Hammer has many valuable improvements made useful in the device for cushioning the blow, thereby relieving all the working parts from that jar and concussion which is the destroying element of other Helve Hammers. It is made Adjustable in Line of Action, Length of Stroke, Rapidity of Motion, and Weight of Blow, all of which are controlled at the will of the operator. They have ***Larger Capacity, Cost Less,*** are more ***Durable,*** take up ***Less Room,*** do ***More*** and ***Better Work*** at ***Less Expense*** for Power, than any other Hammer in use. We guarantee them fully as recommended. For particulars, address

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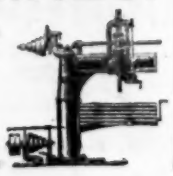

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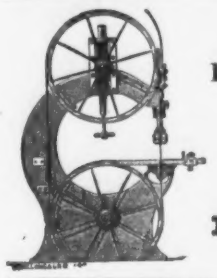

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COMPACT,
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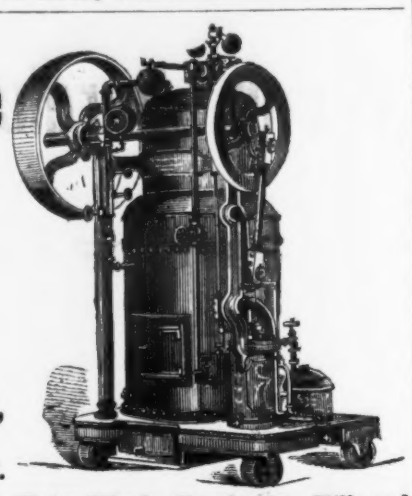

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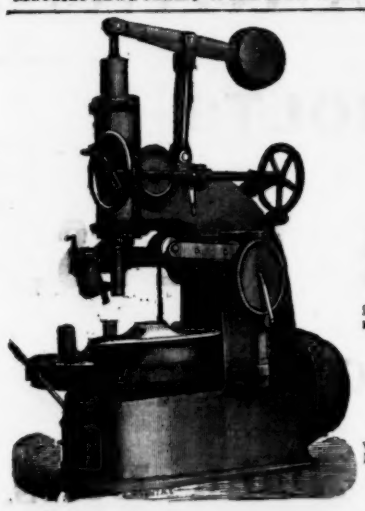

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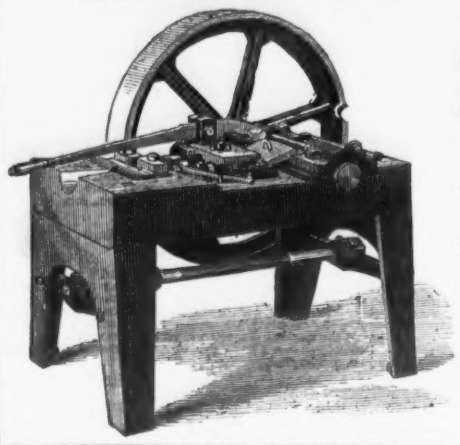

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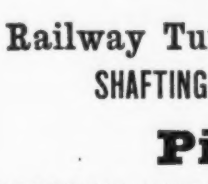
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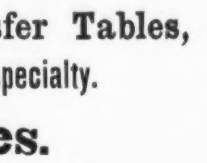
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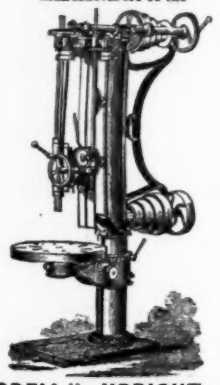

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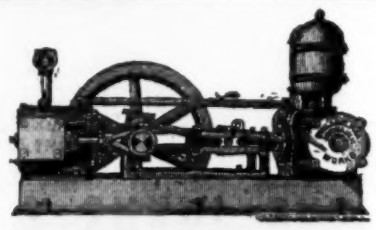

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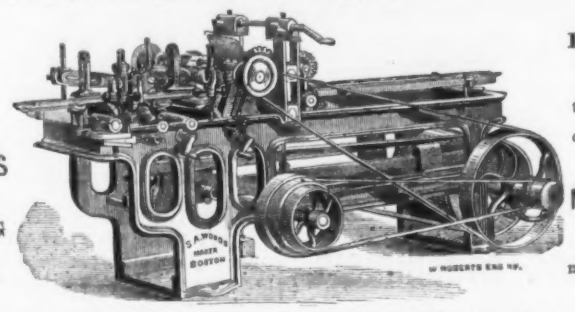

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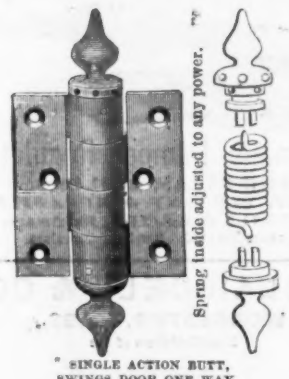

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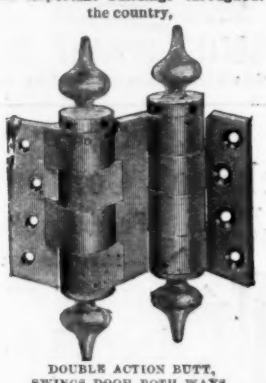

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6 "	" 16	4 00	7 "	" 54	9 50
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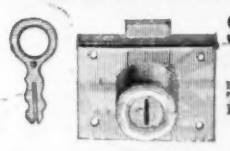

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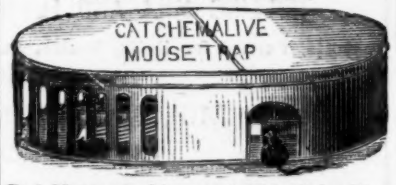

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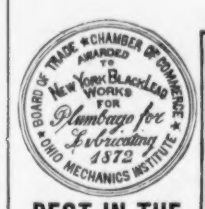

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